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car action

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**SHAFT-DRIVE
SHOWDOWN**

Associated TC3 vs.
Tamiya Evo III vs.
Academy
STR-4

TRINITY
Reflex NT

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OUTLAWS!
22 SMOKIN'
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STAY GLUED! Pro tire tips pg. 184

JUNE 2003

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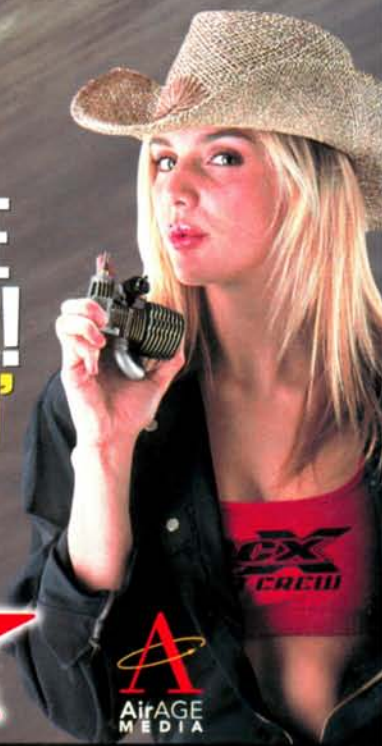
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PLUS

OFNA
NITRO LD3
TEAM LOSI
TRIPLE-XS GP



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VOLUME 18 ■ NUMBER 6 ■ JUNE 2003

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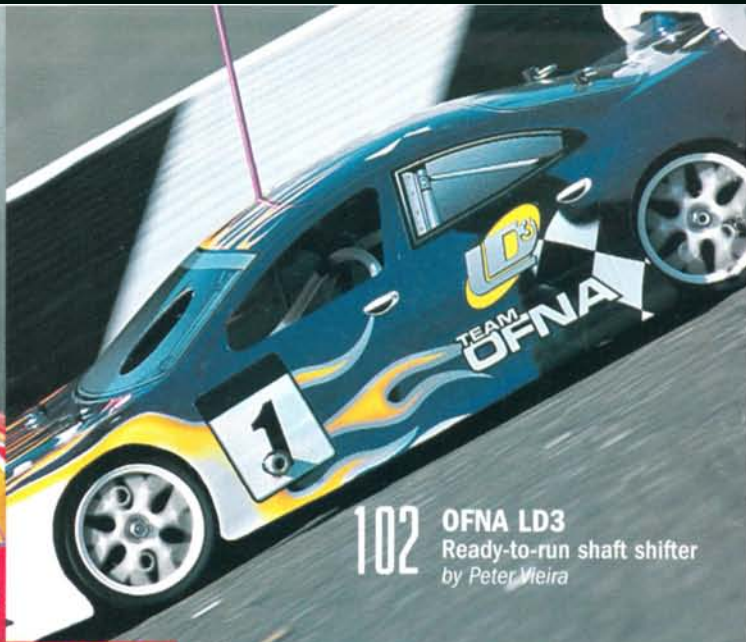
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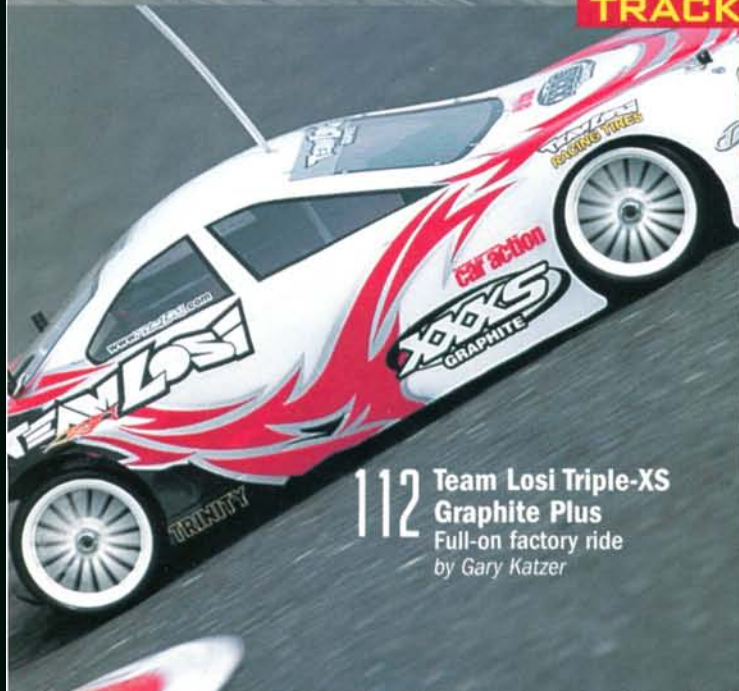


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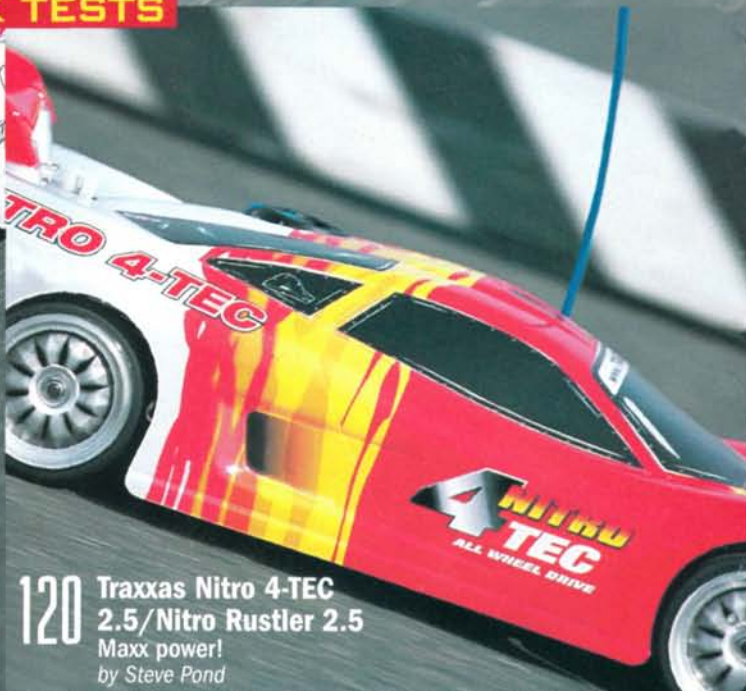


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ON THE COVER: From top left: Traxxas 4-TEC 2.5 and Rustler 2.5; Trinity's Reflex NT Team Only; Sirio 3.0 TX-18 is a smokin' gun. Photos by: George M. Gonzalez, Pete Hall and Deron Neblett.



Testing 1-2-3!

Of all the features we create for *RC Car Action*, the most popular always seem to be the head-to-head vehicle comparison tests. We all want to know which companies make the best stuff! And who can blame us? While some RC gear is certainly more affordable than others, none of it is what you'd call "cheap," and we want to be sure we're making the best choice when we buy.

That's why we do our best to run the wheels off the cars and trucks we test, and we take pains to make the testing as fair as it can be. This month's "Shaft-Drive Showdown" with the Tamiya TB Evolution III, MRC/Academy STR-4 and Associated Factory Team TC3 is a good example. Naturally, all three cars were identically equipped, but we also made certain that they had identical rollouts, and we even used the same bodies; if any car would have an advantage, it would only be because of its superior design and specifications.

Setting up the drivers is just as important as setting up the cars. Six drivers shared the testing duties so that we'd be certain to get a variety of opinions based on their differing skill levels and driving styles. And where their words might fail, lap times do not; we timed all three cars with transponder systems so you can see just what kind of advantage each car can give you on the track.

Good old-fashioned charts are the final component; there are lots of facts and features to compare, and we work hard to make sure you have the data you need. On that note, I hope you'll get a lot out of our three-way test of the latest shaft-drive super sedans. The Tamiya TB Evolution III, MRC/Academy STR-4 and Associated Factory Team TC3 represent the ultimate in ballistic, belt-less machines, and we have the lap times to prove it!

IN THIS ISSUE

Engines! Engines! Engines! If you're shopping for a .15 powerplant (or larger), you'll be happy to see that all the info you need to make a smart buying choice is in our "Outlaw-Engine Buyers' Guide."

Ready to go fast? Traxxas put ready-to-runs on the map, and it has been a staunch supporter of RTRs since the Cat days. Traxxas' latest mission? To make RTRs more powerful than ever—and it looks as if that mission has been accomplished. Check out the revamped, TRX 2.5-powered 4-TEC and Rustler for proof!

For sale: pro drivers' cars. We have two new factory replicas in this issue: the Trinity Reflex Team Only, which is pretty much the same car as Josh Cyrul takes to work, and Team Losi's Triple-XS Graphite Plus—the ride Paul Lemieux and the other guys on the L-train use to dominate the competition. It's cool enough that you can buy 'em at all, and these bad boys are actually bargains when you factor in the "parts purchased separately" prices!

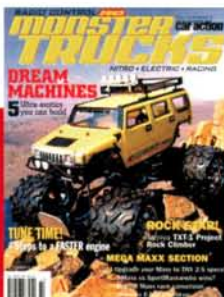
Hot Buns. Trinity has one of the coolest ... er ... hottest ... pieces of pit-table technology to come along in a while: the Digital Heat tire-warmer system lets you crank in exactly as much heat as you need to leave the starting line with mid-race traction, and we have a full "Product Probe" review of the system.

Welcome back, Doogie. Oh great; I just got the theme to "Welcome Back, Kotter" stuck in my head. Long-time readers will remember Doog from his 1992 to 1997 run here at the mag, and it's a fair bet that 99 percent of the action shots burned into your memory during that time were lensed by John Boy. He'll be back behind the camera and the keyboard for next month's issue, so get ready for even more good stuff between the covers of *RC Car Action*! If you'd like to drop John a line, he's at doog@airage.com.

Peter Vieira
Executive Editor

MONSTERS ATTACK

Look out! *Radio Control Monster Trucks* is on the way! Our annual big-tire special hits the newsstands in mid-May, and it's packed; the show-stoppers are a nitro monster truck shootout—19 pages of head-to-head action to see which piston-pounding monster is the best—and the special Maxx section, which is devoted entirely to the Traxxas Maxx trucks! You'll also find mega-buck project trucks, monster how-to's, upgrade guides, engine-tuning info and much, much more—and it's all 100-percent monster trucks!



RADIO CONTROL car action

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HOT STUFF MONSTER HEAD™



Revolutionary head design (left) allows removal or addition of cooling fins to control the head temperature. The perfect way to tune your engines to have maximum performance on the hottest and coldest of days.



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READERS WRITE

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JOSH THIEL DID

I thought that Kevin's Maximum E-Maxx in "4x4" (May 2003) was awesome. Now I have to have Big Joe tires and a Pro-Line Chevy Silverado body (right? The article didn't say what it was). I can buy that stuff, but I'll never be able to do that paint job. Who painted it? Can he (or she) paint a duplicate for me? [email]

Bill Wright

Josh Thiel threw the paint on my Chevy Silverado crewcab; I'm sorry I forgot to mention it! I forwarded your email to Josh; he does custom jobs from time to time.

—Kevin

SPEED COSTS

I just bought a Traxxas Rustler, and I am extremely pleased with how much fun it is to drive and its low maintenance! However, my best friend's (very rich) father bought him a brand-new Stampede and his brother a matching Rustler. It will be fun to have another friend into RC, but I can't lose to someone who can dish out \$300 in one day and not have to work for it! I need to pep up my Rustler for the least amount of money possible. Then I can show my friend that it takes more than just a big wallet to beat me! I know you guys can help me!

Pat Daigler

Going fast with an electric car or truck is just a matter of motor—install the fastest one you can get! The lower the number of "turns" (that's the number of times the motor's armature is wrapped with wire), the faster the motor, but don't run out to buy an 8-turn motor just yet. If your Rustler has a Traxxas XL-1 speed control, you can safely install a motor with 17 or more turns. Anything lower may fry the speed control, but I don't think you'll wish for more speed after you install a 17-turn. To go even faster, you can install a speed control rated for lower-turn motors, but that gets expensive.

—Pete

RADIO DAZE

I have a question for you guys (and the industry in general). Why do RTRs always come with 27-band radios? It seems to me that if you sell a bunch of identical vehicles, you'd be better off not to limit yourself to six frequencies. Am I missing something? Are 27MHz radios cheaper than 75MHz? Just curious.

Mark B. Tucker
St. Paul, MN



I can't speak for all manufacturers, but it's mostly a logistics thing; 27MHz systems are more widely accepted outside the U.S., and since there are only six frequencies, it means that only six item numbers must be stocked, tracked, ordered, etc. And, yes; 27MHz radio systems can be less expensive than 75MHz.

—Pete

BUY BOTH

I've been looking at the Team Losi Triple-X4 buggy and Triple-XS touring car, and they seem to have the same chassis. By a simple overview, the only difference would be the front and rear towers and suspension arms, drive axles and the shocks. My question: is it possible to buy one kit and the spare parts of the other to have two kits in one?

Paolo Caro
Bogotá, Colombia

Sort of; you'd either have a short-wheelbase buggy or a long-wheelbase touring car, depending on which car you started with (the Triple-X4 has a longer chassis). Also, the buggy has a slipper clutch while the sedan does not, and the cost savings won't be as great as you might expect. And do you really want to do that much wrenching? Get a Triple-XS and a Triple-X4!

—Pete

BLEW GROOVE

Please don't call me a traditionalist, but when did off-road racing become on-road racing with jumps? At last year's ROAR Modified Nationals, the spec tires were slicks—tires traditionally designed for on-road racing. I know it was to level the playing field, but you can spec any tire. And it isn't just at the National and World levels but also at my local level. My local track packs the dirt down so hard that it feels like concrete, and the cars don't even get dirty!

HOTSTUFF

RC9800



"Monster Horsepower™" & "TRC" embroidered hats. L-XL fitted style with elastic. \$9.99 each

RC9700



TOURING TIRE HAULER



Hauler bag for 8 pairs of tires. Comes with TRC tire tubes. RC9048, \$24.99



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READERS WRITE

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When is the last time you saw a full-size rally car or a Baja racer or stadium truck go through a race and not get dirty? Big knobby tires throwing up a rooster-tail—now *that's* off-road racing. Eighth-scale gas racing shouldn't be the only way to have real off-road fun. [email]

Nate Risch

I'm with you, Nate; nothing beats old-school knobies tearing up a soft, loamy track. But for track operators, it can be a headache; the track conditions are always changing, and it requires more maintenance to keep the lips on the jumps and to smooth out ruts. And some racers complain when the setup they used to qualify in the morning is no good for the Main in the afternoon because the track conditions have changed. Yep, there are some valid

reasons for going blue-groove—but I'll take the soft stuff any day.

—Pete

ANOTHER SCENE STARTED

I have now been into the RC hobby for a few years. I currently own a DuraTrax Evader and a Traxxas T-Maxx. I live down the road from a school and race my RC cars in its huge, open parking lot. I have attracted many spectators and attract more and more as the weeks pass. Every now and then, I let a few people try out my trucks. Since I started, I've recruited nine people into this very addictive hobby. We now race every weekend. Who would have known how great the hobby is? RC is the bomb. You guys are awesome. Keep up the great work. Josh Semke
Salem, WI

YOU SAID IT

"A lot of us would rather buy these cars and trucks in kit form ..."

I have a concern. It seems that the growing trend is for manufacturers to produce more and more RTR cars and trucks. I subscribe to a few online RC message boards, and I've noticed that the people who post there, along with myself, are not too happy about this. I can't speak for everyone who enjoys this hobby, but I'd say a lot of us would rather buy these cars and trucks in kit form. I understand that not everyone has the technical expertise to handle some of the more difficult kits, and that's why RTR can be a good thing. But for most of us who are really into these cars and trucks, and who aren't beginners, we like to build them ourselves. I also like to be able to choose the radio I want to use as well as the engine, receiver and servos. It can become a huge waste of money for us to buy RTR kits and then have to change everything to our liking.

Is there a way you guys could let other readers know how some of us feel on this subject and maybe get them to write the manufacturers and express their opinions? A few of us who are concerned have emailed the companies, but 15 or 20 emails won't change a thing. I feel that if more people expressed their opinions, it might make a difference.

Trey Allen
Cheyenne, WY



OK, Trey; you just reached more than 100,000 RC fans! Remember, readers: the manufacturers' number-one priority is to produce what you want to buy ... and I'm not just talking about kits versus RTRs. If you want to see anything changed about your favorite products, tell the makers! If they hear enough people saying "Do this," they'll do it!

—Pete

Each month, "Readers Write" sponsor Team Trinity awards the "You said it" letter writer the Reference body of his choice. This is Trinity's Stratus "Y."

WRITE TO US! We welcome your photos, drawings, comments and suggestions. Letters should be addressed to "Letters," Air Age Inc., Radio Control Car Action, 100 East Ridge, Ridgefield, CT 06877-4606 USA. Letters may be edited for clarity and brevity, and each must include a full name and address or telephone number so that the identity of the sender can be verified. We regret that, owing to the tremendous numbers of letters we receive, we can't respond to every one.

■ Peter Vieira: peter@airage.com
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■ Kevin Hetmanski: kevin@airage.com
■ John Howell: johnh@airage.com
■ Paul Onorato: paulo@airage.com
■ Steve Pond: steve@airage.com
■ Jason Sams: jason@airage.com



RCX SUPER TRUCK!

KYOSHO RCX-edition Mad Force

If you're reading this before May 3, you'd better get yourself down to the Anaheim Convention Center. You don't want to miss RCX: "The Ultimate Radio Control Expo"! Along with hot products from all of RC's big players, there will be demos, music, full-scale vehicles and more.

Kyosho is the first to launch a special-edition vehicle just for the show. The RCX Mad Force is a totally worked version of Kyosho's already hairy mega-monster. In addition to the stock 3-speed tranny, the RCX machine includes all this stuff:

- Universal-joint center shafts
- Tubular manifold
- Polished, "hard" chassis plates and lower deck plate
- Double shock mounts
- Ultra Soft springs
- SP steering-rod set
- Aluminum steering bellcranks
- Turbo Big Shocks
- O.S. .21 RG-X (P) engine

Yes, you did read that correctly: an O.S. engine is included! We'll test the RCX Mad Force soon; in the meantime, get to Anaheim and see it at RCX!

Kyosho; distributed by Hobbico/Great Planes Model Distributors (217) 398-8970; kyosho.com.



SUPER NOVA



NOVAROSSİ RS12

Trinity is the exclusive agent for Novarossi in the U.S., and the latest engine to be uncased from Italy is this screaming-fast .12 powerhouse. The RS12 is a no-holds-barred "turbo" engine; that means it takes turbo-type glow plugs (you probably guessed that) and has "turbo" porting on the crank's counterweight to help distribute the fuel/air mixture through the engine's 5-port sleeve more efficiently for maximum horsepower (that, you probably didn't guess).

Novarossi; distributed by Trinity Products Inc.
(732) 635-1600;
teamtrinity.com.



VERY VOODOO

TRC Off-Road Zombie & Mambo glued buggy tires

You're looking at the newest treads in TRC's Off-Road lineup. The Zombies have a ladder-bar tread for forward bite and fine square knobs to keep you hooked up in the groove, and the Mambo 4-rib front tires will keep your buggy pointed in the right direction. Both are available on new dish wheels, and they carry TRC's "Guaranteed to stay glued" promise. If the tires come off the wheels while in use, TRC will replace them. You may never CA your fingers together again!

TRC Off Road; distributed by Trinity Products Inc.
(732) 635-1600; teamtrinity.com.

TRINITY

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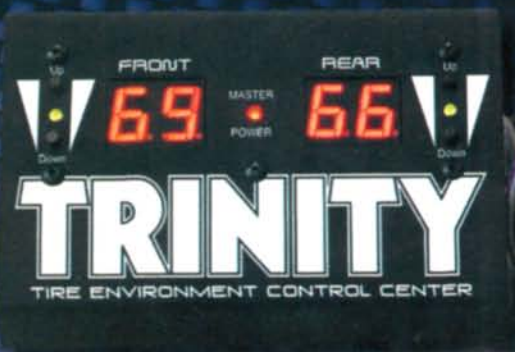
Adjusts front and rear tire temperatures separately or left and right for oval racing.

Temperature range from 01°C to 98°C (33°F to 208°F)

Fits a maximum tire diameter of 65mm (2.559")

Works with rubber or foam tires

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RC6078

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Super Tire Warmers

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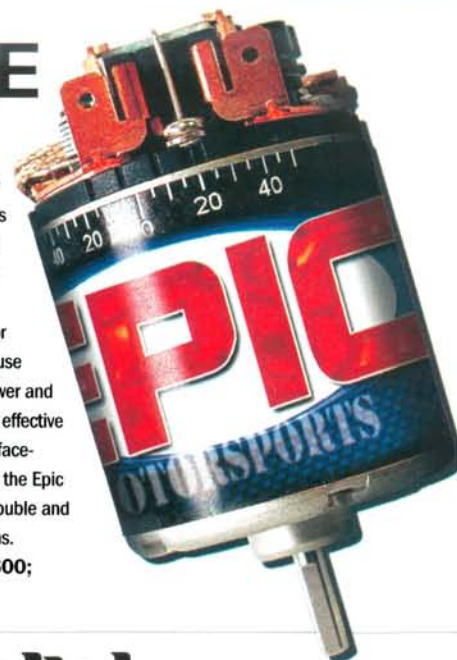
AN EPIC TALE

EPIC Flat-wire Modified

Epic—isn't that the name on the Trinity motors? It sure is, but now Epic has a full line of products aimed at serious racers. "Oh, so it's expensive stuff," you say. Not according to the Trinity guys; they've told us that the Epic batteries and motors will match high quality with "the best pricing for the racer."

The first fruit of this new endeavor is the Epic Flatwire Mod Motor Series. These aren't relabeled D5s; the new motors are the first to use Epic's "Binary 2" four-magnet system, which claims to increase power and rpm. The motors also get the big-brush technology that has proven effective with the P-94 and D5, and they also have externally hard-wired surface-mount capacitors. In addition to flat-wire winds from 6 to 14 turns, the Epic mods will be offered in 12-turn "Euro Spec" versions with single, double and triple winds customized for "big track" and "tight track" applications.

Epic; distributed by Trinity Products Inc. (732) 635-1600; teamtrinity.com.



yokomo boots belts!

YOKOMO MR-4TC SD SSG Special

Yokomo was the first to popularize belt drive in touring cars, but what's this—a shaft-drive Yoke? The latest MR-4 Series car is indeed shafted and packed with features. The striking aluminum-finish "SSG" graphite first seen at the Worlds is in full use, with a 3mm lower deck and a 2mm upper tray. There's a front one-way unit and a ball differential at each end of the drive shaft, and there isn't any shortage of anodized-aluminum coolness, from the threaded shocks and outrdrives to the spur-gear hub and wheel hexes.

Yokomo USA (949) 252-8663; yokomousa.com.

We Invented It & We Still Do It Best



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19 turn, 19 awg
Adjustable timing
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or standup motors

Control the black art
of brush tuning
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RC2122, \$49.99



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Locked timing
Bushings
Street Spec Legal
SS2226, \$34.95



Caliber
19 turn double
Locked timing
Bushings
9323, \$19.99

Brought to you by Trinity Products Inc.



COMFY CRUSHER

PRO-LINE Cadillac EXT for long-wheelbase Maxx trucks

Caddy's truck/sport-ute/luxo-cruiser/ballermobile hybrid looks like nothing else on the highway, and now you can get the edgy look for your Maxx. Pro-Line's Cadillac EXT shell is long enough to cover your .21 converted T-Maxx (or stretched Clod Buster chassis), and the usual Pro-Line pluses are included: overspray film, window masks and all the detail decals and logos you'll need.

Pro-Line (909) 849-9781; pro-lineracing.com.



THANKS FOR THE MEMORIES

HITEC Aggressor CRX

Twenty of them, to be exact: the Aggressor CRX can store 20 models in its memory, and that's just the first in a long list of features for Hitec's 3-channel FM pistol. Digital trims and a menu-type dot-matrix display make it easy to set up dual rates, endpoints, exponential settings and more. Hitec will offer the CRX with your choice of a conventional crystal-type module (27 or 75MHz) and the Spectra synthesizing module (75MHz only). Both systems include a DCX receiver, but for a limited time, you'll be able to buy the Spectra setup with a Novak XXtra synthesizing receiver for a no-crystal package. All CRX systems include a Ni-Cd battery pack and a wall charger. Hitec RCD Inc. (858) 748-6948; hitecrd.com.



TALES FROM THE KRYPT

REEDY Krypton Modified

The "Kr" stands for "Krypton," the successor to Reedy's successful Ti Series mods. Installed capacitors and color-coded brush heat sinks are nice touches, but the big features are the Krypton's "Quad Magnet Four-Field" technology (there are four magnets in the can instead of two) and the 9mm "midsize" commutator, which Reedy says helps to dissipate heat more effectively. Single, double and "big track" special winds are available. It also makes an excellent Superman repellent.

Reedy; a division of Team Associated (714) 850-9342; teamassociated.com.

FOAM FREE

VENOM RACING

Magnetics no-insert tires

Instead of a foam insert, Venom's latest Magnetics tires have a molded-in honeycomb pattern to support the tread. Two styles are offered: Hyper Grip, with a rounded-tread cross-section, and Super Grip, with a flatter profile. Both styles have the same herringbone-style tread pattern.

Venom Racing (800) 705-0620; venom-racing.com.





PROTOFORM Ascari

You're looking at "the ultimate statement in downforce and handling," according to Protoform, and judging by the Ascari's deeply contoured lines, Protoform isn't exaggerating. The super-low-profile body fits all popular 1/12-scale chassis and is available in lightweight 0.020-inch and "regular" 0.030-inch Lexan. Both versions include overspray film and decals.

Protoform; distributed by **Pro-Line** (909) 849-9781; pro-lineracing.com.

WILD WEDGE

LAP IT UP

RC MICROSIZERS Digital lap counter

This slick lap counter is part of the MicroSizers line, but it isn't just for ultra-micros; you can also use it with "mini" vehicles (such as Kyosho's Mini-Z series). Every time your car passes between the lap counter and the reflective "sensor arm," it breaks an infrared beam. That indicates a completed lap, and the lap time is recorded to 1/100 second. You can program the unit to count laps for up to 10 minutes, or you can set it to count 1 to 500 laps. The unit will beep whenever a new low-lap-time record is set, and it lets you know when your race is close to the finish with flashing LEDs and an audio signal.

RC Microsizers by Hobbico/Great Planes Models Distributors (217) 398-8970; hobbico.com.



GLUE GRABBER

VENOM RACING

Hands Free tire gluer

If you're a freak for a perfect glue job, this is the tool for you. Venom's Hands Free gluer pulls back the sidewall for easy glue application and lets you roll it back down slowly for a perfect no-drip bond. It works with all touring-car wheel and tire combos and is shown here with Venom's Magnetics no-insert tires.

Venom Racing (800) 705-0620; venom-racing.com. ■

future shock

PRO-LINE Interceptor body for Associated B4

Pro-Line's Interceptor shell is the official body for the new B4. World champion driver and Kevin Hetmanski look-alike Mark Pavidis helped sculpt the body's futuristic look, which includes double air scoops, an ultra-low profile and a short-nose layout that snugs tightly to the B4 chassis. Two Lexan wings, overspray film, window masks and a Team Pro-Line decal sheet are included, plus a poly bag and swell header card.

Pro-Line (909) 849-9781; pro-lineracing.com.



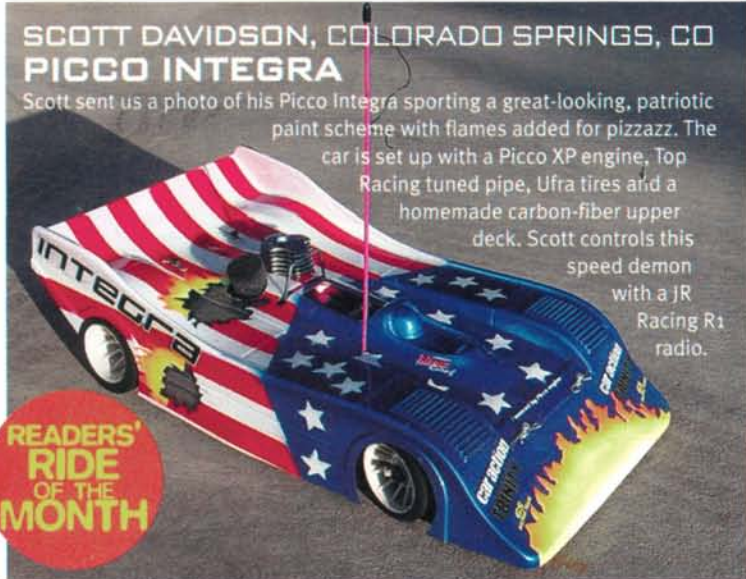
readers' rides

YOUR BEST BUILDS

SCOTT DAVIDSON, COLORADO SPRINGS, CO PICCO INTEGRA

Scott sent us a photo of his Picco Integra sporting a great-looking, patriotic paint scheme with flames added for pizzazz. The car is set up with a Picco XP engine, Top Racing tuned pipe, Ufra tires and a homemade carbon-fiber upper deck. Scott controls this speed demon with a JR Racing R1 radio.

READERS'
RIDE
OF THE
MONTH



GREG SANTOS, MISSION VIEJO, CA TAMIYA M-03L

Yeah, baby! It's the Shagmobile from "Austin Powers in Goldmember." There is no mistaking what must be one of Greg's favorite movies when you check out his Mini Cooper. His Tamiya M-03L chassis has been outfitted with a full set of ball bearings, and an LRP ESC and a Trinity P2k2 motor get this spymobile rolling.



MARK TURKEL, BOYNTON BEACH, FL ASSOCIATED NITRO TC3

Under the Mercedes CLK-GTR body is a fully hopped-up Associated Nitro TC3. What Mark did not do was buy any "eye-candy" parts; he opted only for upgrades that would improve the overall performance—an RB Concepts .12 engine, Sorex 36r tires and a bunch of other go-fast goodies. That strategy recently paid off with a win at a two-hour endurance race with the Palm Beach RC Racers.



TARA BORDEN, DE KALB, IL CUSTOM TAMIYA CLOD BUSTER

Tara is the proud owner and driver of a "Tara'fied" monster truck. This highly customized Tamiya Clod Buster has been fitted with a Thunder Tech Racing Ripper chassis, JPS axles, TXT-1 wheels, Imex Road Dawg Puller tires, Associated shocks, Trinity P94 11-turn motors and a Novak Super Rooster ESC. FCA Grafix laid down the paint on the Parma pick-up body. Nice ride, Tara!

WIN A ONE-YEAR SUBSCRIPTION TO RADIO CONTROL CAR ACTION MAGAZINE!

Send a sharp, uncluttered, well-exposed color photo of your vehicle (no Polaroids) and a brief description to "Readers' Rides," *RC Car Action*, 100 East Ridge, Ridgefield, CT 06877-4606 USA. If we publish your photo, you'll receive a free, one-year subscription to *RC Car Action* and will be eligible to win the "Reader's Ride of the Year Contest." Write your address and phone number on your letter and on the back of every photo you send. For email submission tips, visit rccaraction.com and click "Readers' Rides."

BRIAN UNDERWOOD, FOUNTAIN INN, SC HYPERDRIVE 0700 EASE

Sitting beneath the Protoform 2002 Monte Carlo body is a Hyperdrive 0700 EASE pan car. Brian has set up his on-road racer for speed with a Trinity P2k2 motor, a Novak ESC, spec tires, a BRP rear wing and Futaba radio gear. Heads up if you see him at the local track in South Carolina; Brian is ready to race!



KIM NORGAARD, RANDERS, DENMARK TAMIYA TXT-1

Monster trucks are going strong in Denmark. This Tamiya TXT-1 is just one of Kim's RC vehicles, but he tells us that it's one of his favorites. Kim fitted his rig with Associated shocks and heat sinks, Trinity Speed Gem Opal motors, a Hitec steering servo and an LRP F1 Pro ESC. The steering links, pushrods, skidplates, radio shelf and body post are custom.

The Best Kept Secret in Racing...



Reedy "X-cell" GP3300's.
Reedy/Yokomo Gold Peak 3300's have longer run times than most other 3300 Ni-MH cells, and have a great low price that makes them your **BEST** choice!

- #665 Reedy GP3300 "X-cells", 6-Cells...\$89.99
- #664 Reedy GP3300 "X-cells", 4-Cells... \$59.99



Reedy 3300 "Extreme" Sanyos. The newest 3300 Ni-MH cells from Sanyo! The Reedy 3300 "Extreme" cells are cycled, matched, and voltage treated for on-track performance you can really feel.

- #660 Reedy 3300 "Extreme" Sanyos, 6-Cells...\$129.99
- #659 Reedy 3300 "Extreme" Sanyos, 4-Cells... \$87.99



**JORDAN STEINKIRCHNER,
AFTON, OK
TAMIYA BRUISER**

This vintage Tamiya Bruiser is mostly stock, but Jordan modified the cab so it would look like a Tamiya Mountaineer body and added the working headlights. He tells us that this is no shelf queen; he runs it whenever he can. I'm with you, Jordan. Run 'em!

**MATTHEW PRACHAR, GROVE CITY, OH
HPI RS4 PRO 2**

This BMW M3 is ready for some door-to-door touring-car racing. Matthew's HPI Pro 2 is decked out with a full graphite chassis, MIP CVDs, aluminum motor mount, heat sink and bulkheads and a front one-way diff. A Trinity Green Machine motor powers this Bavarian sports car, and a JR XR2 programmable radio system keeps it under control. ■



and New **MATCHED** Sport Packs!



Reedy's "Rated-X" Matched sport pack batteries use genuine Panasonic or Sanyo Ni-MH cells that have been given the same cycling, matching, and voltage treating as Reedy's championship-winning racing cells. The batteries are fully assembled in clear tubes so you can see the matching info right on the label of each cell. Don't settle for "mystery" cells in your sport packs... get Reedy's "X-Rated" packs and see the power you've been missing!



#698 Reedy "Rated-X" Sport Pack, Sanyo cells

#699 Reedy "Rated-X" Sport Pack, Panasonic cells

**ONLY
\$59.99**

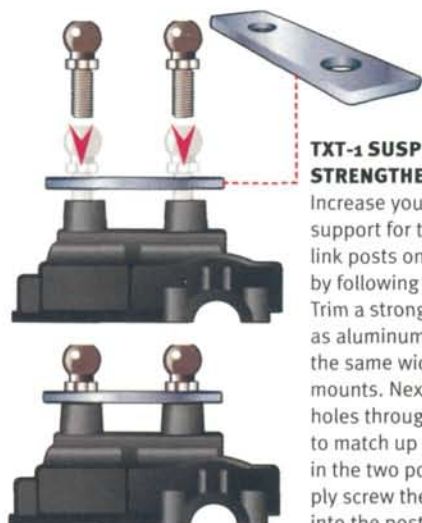


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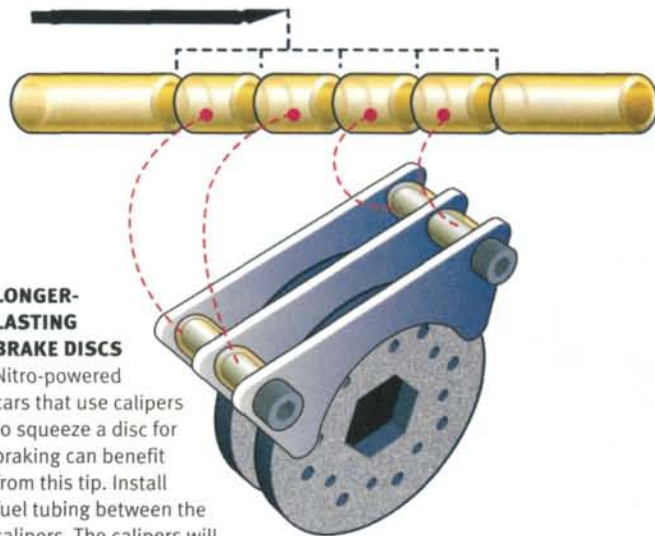


TXT-1 SUSPENSION STRENGTHENING

Increase your Tamiya TXT-1's support for the suspension-link posts on the gearboxes by following this simple tip. Trim a strong material such as aluminum or graphite to the same width as the two mounts. Next, drill two holes through the material to match up with the holes in the two posts. Then simply screw the ball ends back into the posts. The material you added will help prevent

the post from being broken off.

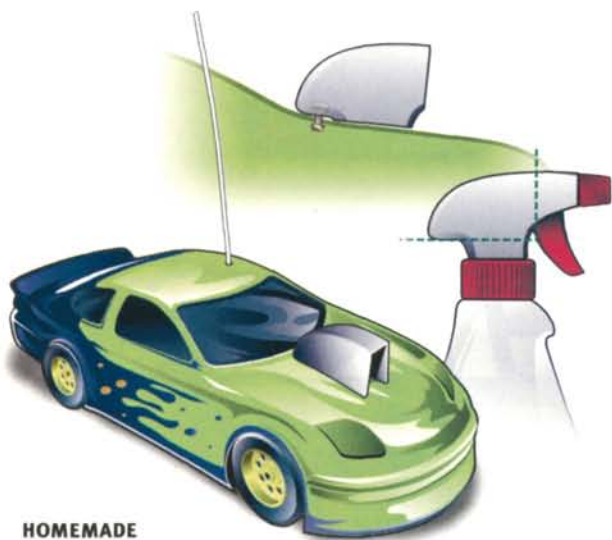
*Christian Roy
Duluth, GA*



LONGER-LASTING BRAKE DISCS

Nitro-powered cars that use calipers to squeeze a disc for braking can benefit from this tip. Install fuel tubing between the calipers. The calipers will no longer rub against the disc when the vehicle is running and prematurely wear it out. The fuel tubing is soft enough to be compressed when the brakes are applied and resilient enough to keep the calipers separated.

*Dennis Simmons
Redford, MI*



HOMEMADE ENGINE SCOOP

Make your RC vehicle look as if it has massive horsepower under its hood by adding a fake scoop. Take the sprayer off a spray bottle and trim it to resemble a scoop as shown, and then attach the "scoop" to the body using a screw and nut. You can paint the scoop to match the vehicle's scheme.

*Russell Krapf Jr.
E. Northport, NY*



TC3 SPUR-GEAR PROTECTION

On a TC3, the body clip that holds the battery strap down sits so close to the spur gear that it could accidentally be pushed into it (and ruined) when you're racing. Turn the battery strap mount so that the body clip is no longer in line with the spur gear.

*Paul Burton
Union, NJ*

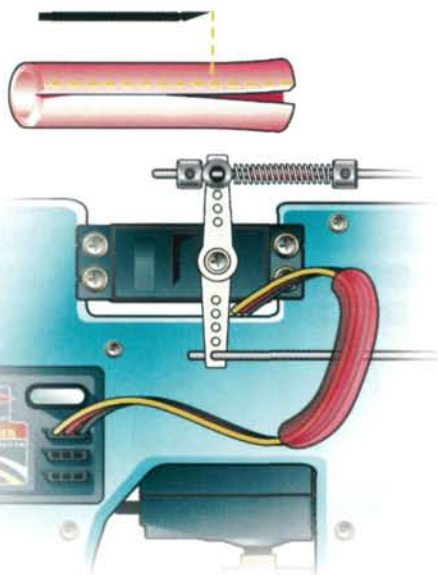
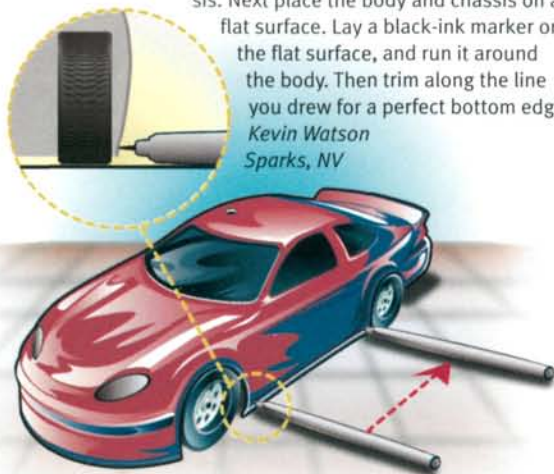
WIN AN OFNA YO-YO, OFNA OB4 AND RC CAR ACTION SUBSCRIPTION! SEE NEXT PAGE FOR DETAILS.

BODY TRIMMING

Use this trick to make your vehicle body's bottom edge perfectly parallel with the ground. With the wheel wells cut out and the body's perimeter only roughly cut around, fit the body on the chassis.

Next place the body and chassis on a flat surface. Lay a black-ink marker on the flat surface, and run it around the body. Then trim along the line you drew for a perfect bottom edge.

Kevin Watson
Sparks, NV



WIRE GUARD

If the wiring on your chassis is too close to moving parts that can wear through it, e.g., servo horns and transmission gears, try this. Cut a piece of fuel tubing to the same length as the wire that needs protection, slit it lengthwise, and slide it over the wire.

Brian Goldenbeck
Daytona Beach, FL

MIX IT RIGHT

Cars that run on gasoline require that oil be mixed with the fuel at a specific ratio. Those who ride full-size motorcycles and snowmobiles use Ratio Rite, which is a graduated cylinder used to accurately measure the correct amount of oil to be mixed with the gas. Just fill the cylinder with oil to the ratio listed on the side of the cylinder that corresponds with the amount of gasoline used.

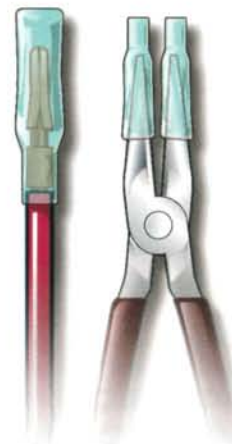
Pete Whelan
Long Beach, CA



SOFT-GRIP PLIERS

If you use pliers to hold shock shafts when you assemble shocks, the pliers' jaws might damage them. To avoid this, you'll need the rubber boots that slide over bullet connectors. Slide the boots over the pliers' jaws so that they don't damage delicate parts. Alternatively, you can force fuel tubing onto the pliers.

Hector Gomez
Los Angeles, CA



NO MORE DEAD BATTERIES

Sick of leaving your receiver turned on by mistake and draining the batteries? Put a dab of brightly colored paint on the recessed part of the on/off switch when it's in the "on" position, and you'll be able to tell at a glance whether you left the receiver turned on or not.

Tom Breton
Athens, PA

"Pit Tips" are submitted by readers and are screened for functionality, feasibility and safety but are not tested by Radio Control Car Action. Radio Control Car Action and the submitting authors are not responsible for personal injury or damage to models or tools resulting from readers' use of "Pit Tips."

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troubleshooting

YOU'VE GOT PROBLEMS? WE'VE GOT FIXES.

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RUN-TIME CONCERNS

My Losi Triple-X truck is equipped with Trinity VIS 3000 matched cells, a 9-turn D4 motor and an LRP Quantum reversing speed control, and I run it with a 72-tooth spur gear and either a 25- or 21-tooth pinion. My average run time of 3½ minutes just doesn't seem long enough. Please help me figure out how to increase it. [email]

Daniel

Try a pinion gear that has fewer teeth; the two you run with are generally used for stock motors. Start with a 17- or 18-tooth pinion, and work your way up until you find a good combination of power and run time.

After you've installed the appropriate pinion, check the motor's temperature; gear changes can sometimes make a motor run too hot. To check motor temperature, place a drop of water on the motor can immediately after you've run the car and depleted its battery pack. If the water evaporates in less than 10 seconds, the motor is too hot, so you should gear down (install a smaller pinion gear). Running the motor overly hot will drastically shorten its life, and your run times will suffer as well.

If you find that your run time hasn't increased after you change the gear, it may be that your truck's diff is too loose, and that will certainly decrease run time. To check the diff, hold the right wheel in your right hand and press your right thumb against the spur gear. Try to rotate the left wheel with your left hand. If the diff has been adjusted correctly, the wheel should be very difficult to rotate. If the wheel turns easily, you'll need to tighten the diff. Check your truck's instructions for details on diff adjustment.

If your truck still has lousy run times after you've made these changes, check the drive train for binding, and cycle your battery pack a few times before its next use.



It's a good idea to pick up an assortment of pinions so you'll be able to figure out the gearing combination that works best for your setup. Just make sure that the pinions have the same pitch as your spur gear.



If your diff is set too loose, your run time will suffer. Hold the right rear wheel and spur gear to prevent them from rotating, and then try to spin the left rear wheel. If it's difficult to rotate it, the diff has been set correctly.

REAL PERFORMANCE PRODUCTS!

T-Maxx/2.5-Maxx Steel Top Shaft

NEW



This precision machined **hardened** steel top shaft will fit all T-Maxx. Includes oversize ball bearing. RRP 8525

T-Maxx/2.5-Maxx FORWARD ONLY Steel Gear Kit

NEW



This kit contains a 26T **hardened** steel output gear, a forward drive hub adaptor, steel spacer and Pin. RRP 8586. **Hardened** aluminum version RRP 8585.

T-Maxx/2.5-Maxx Hardened Forward Primary Gear

Precision machined from solid steel and then **hardened**. RRP 8529. **Hardened** aluminum version RRP 8528.

NEW



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T-Maxx/2.5-Maxx Forward Primary and Reverse Gears

NEW



This kit contains a precision machined **hardened** steel primary forward gear, a **hardened** aluminum reverse gear and pin. RRP 8521

T-Maxx/2.5-Maxx Primary Reverse Gear

This gear is precision machined from solid aluminum and **hardened**. Includes pin. RRP 8522

NEW



MAKE NO COMPROMISES!

T/E-Maxx/2.5-Maxx Accessory Spurs



A wide range of spurs fit our Double-Disc Slipper Kits. Choose from machined Super-Tough plastic spurs in 66, 68, 70, 72, 74 and 76T sizes, RRP 82XX, or CNC machined steel spurs available in 65, 72 and 76T sizes, RRP 83XX. Small Clutch Plate/Gear Adaptor fits 65 thru 70T spurs. Large Clutch Plate/Gear Adaptor fits 72 thru 76T spurs.

T-Maxx/2.5-Maxx Lightened Spur And Double-Disc™ Slipper Kit



RRP's NEW line of Lightened Spur and Double-Disc Slipper Kits for Traxxas Nitro and T/E-Maxx/2.5-Maxx trucks are designed to improve performance and increase reliability. This combo incorporates a machined steel or Super-Tough plastic spur, a Vented Aluminum Clutch-Plate/Gear Adaptor, 2 Slipper Pads and 2 Plates to deliver the adjustability you need and the increased performance that you demand. **Complete Slipper Kits** are available in the following sizes: RRP 8166 Slipper Kit with 66T Super-Tough plastic spur (Stock Size) for E-Maxx. RRP 8172 Slipper Kit with 72T Super-Tough plastic spur for Traxxas Nitro. RRP 8465 Slipper Kit with 65T Steel Spur for Traxxas Nitro. RRP 8472 Slipper Kit with 72T Steel Spur (Stock Size) for T-Maxx. Spurs, Clutch-Plate/Gear Adaptor and Slipper Pads also sold separately.

LOOSE PIPE

To increase the engine's performance, I recently purchased a new tuned pipe for my Nitro Stampede. Ever since I installed it, I've had trouble keeping it attached to the manifold. The darn thing just slides off the silicone coupler. How can I resolve this? [email]

Steven Payne

The need to repeatedly reinstall a hot tuned pipe in the coupler can be a real pain in the butt. Here are a couple of tips that should help it stay put. Thoroughly clean the pipe's coupler with nitro cleaner, motor spray, or denatured alcohol.

Unburned fuel acts like a lubricant, and any gunky residue can cause the pipe to slip off the header. Next, scuff the ends of the pipe and the header with a hobby-size file or sandpaper. The rough areas will improve the coupler's "grab" when you secure it to the pipe and manifold with heavy-duty zip-ties. When you install the clean coupler, be sure to slide it on both the pipe and the manifold as far as it will go. For even greater security, you can enlarge or "flange" the ends of the pipe and manifold with a screwdriver. Simply place the tip of the screwdriver into the end of the pipe and gently press out while rotating the tip to form a flange; do the same to the end of the manifold.

Right: use a screwdriver as shown in the photo to create a flange around the edge of the muffler opening. This flange will "grab" the coupler and help it stay in place.

Far right: Trinity's Nitro Blast is great for removing nitro residue from inside the coupler.



T/E-Maxx/2.5-Maxx Steel Diff Gear Set



T/E-Maxx/2.5-Maxx differential gear set, includes: 1 beveled pinion gear, 1 beveled spur gear, 4 re-usable stainless steel Phillips head screws, 1 tube Associated Black Grease, and a shim kit for spider gears with 10 .003" shims. 2 sets needed per truck. RRP \$590

T-Maxx/2.5-Maxx Aluminum High Performance Brake Kit



New, lightweight aluminum high performance brake kit, includes bigger, more aggressive brake pads and steel backing plates. One piece vented rotor minimizes side-to-side wobble. Also fits newer T-Maxx. RRP \$562
Older style half shafts use Brake Kit RRP \$560.

DON'T SETTLE FOR SECOND!



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T-Maxx Vented Flywheels



Aluminum vented flywheels move air over clutch bell, improving performance and cooling. RRP \$551 Blue, RRP \$550 Natural Silver
NEW 2.5-Maxx Vented Flywheel, Blue Only RRP \$552.

T/E-Maxx/2.5-Maxx Replacement Pinion



This precision machined steel steel pinion fits RRP \$590 Diff Gear. RRP \$591

FORWARD ONLY Racing Gearbox For T-Maxx/2.5-Maxx



Precision CNC machined from aircraft grade billet aluminum this FORWARD ONLY Racing Gearbox will give your T-Maxx or 2.5-Maxx a serious competitive edge. RRP \$595

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TIRE TROUBLE

I love to run my RC10GT, but the tires become partially unglued after every few runs. It's usually a rear tire that gives, but one of the front tires has come unglued as well. I use the CA recommended by my hobby store, and I have glued quite a few tires in the past without any problems. What causes the tires to come unglued? [email]

John Teater

Before you glue a new set of tires, you can do a few things that will ensure a proper bond. First, use Lexan scissors to cut away the excess rubber flashing from the inside gluing edges of the tires. Then clean the tires with warm soapy water to remove any mold-release residue left over from the molding process. While the tires dry completely, use a hobby knife to remove any excess plastic flashing from the rims. Put the foam inserts in the tires and slide the tires over the rims.

Force the tires' mounting beads into the rims' mounting grooves. Stretch a heavy-duty rubber band over the side of the tire that you plan to glue first. You may have to double up the rubber band so that it will remain very tight after you apply the glue. With your thumb, peel back a portion of the tire to expose the mounting bead, and place the tip of the glue spout in the gap. Apply a few drops of CA (tire glue) into the gap and then work the glue around the rim a section at a time. As you rotate the tire and expose a different portion of the rim's mounting groove, you'll eventually work the CA around the tire. Let the glue dry completely before you move to the tire's other side.

Just as you clean a Lexan body to remove mold-release agents before you paint it, do the same for tires so that glue will stick properly to them.



Use tire-specific glue to bond the tire to the wheel. Take the time to work the glue around the rim without missing a section.

RS4 Nitro Aluminum Brake Kit



Lightweight aluminum, variable braking system. RRP 1575

RS4 Nitro Vented Flywheel



Aluminum vented flywheels move air over clutch bell, improving performance and cooling. RRP 1570 RRP 1571 Pull Start

48P Absolute Series Pinions



Super hard, lightened and cut with unmatched precision. Great with any spur, but with an Absolute spur, even on-off noise is gone! Available in 48P in 16T thru 28T sizes. RRP 1416 - RRP 1428.

T-Maxx/2.5-Maxx Hardened Steel Clutchbells



CNC Machined from solid steel these bells are built to last. They take the 5x11 bearing (NOT included). Available in 19T, RRP \$119, 20T RRP \$120, 21T RRP \$121 and 23T RRP \$123.

RS4 Nitro Small Aluminum Drive Pulleys



Hardened drive pulleys, sold in pairs. RRP 1536

48P / 64P SuperLite Aluminum Pinions



They're lightened, hard coated and precision cut. Available in 48P in 16T thru 28T, and 64P in 24T thru 38T. RRP 30XX (48P) and RRP 31XX (64P). Only \$5.25

Stealth Spurs



These precision machined spur gears are super quiet. They're available in 48P in 60T thru 96T sizes, and fit any Associated or HPI electric car or truck. RRP 1880 thru RRP 1896.

RC-10GT 48 Pitch Spurs



Precision machined from heat-resistant, super tough plastic, these spurs mesh flawlessly with our Clutchbells. Available in 63T thru 67T, RRP 2263 - RRP 2267.

48P Hard Nickel Plated Steel Pinions



These precision cut gears have an extremely hard coating that makes them really last. Available in 12T thru 35T. RRP 1012 - RRP 1035

SAVE BUCKS WITH RECHARGEABLE BATTERIES

I love my Kyosho Mini-Z F1, but I have been spending a bunch of money on AAA alkaline batteries for it. Are rechargeable battery packs available for the Mini-Z F1? I'm broke! [email]

Andrew Martonik

Electronics stores typically carry rechargeable AAA batteries in various capacities and battery chargers. Most department-store chargers aren't quick charging; those units need 8 to 10 hours to completely charge drained batteries. But if you pick up a couple of sets of batteries, you should be able to run your Mini-Z for a few hours or more before you need to recharge.

Keep in mind that alkaline batteries put out slightly more voltage than Ni-Cd and NiMH batteries, so your car will lose some of its acceleration and top-end speed when you make the switch. If you do go the rechargeable-battery route, consider picking up the optional Mini-Z modified motor to bring your car back up to speed, or install a pinion with more teeth.



Check out this PowerEx battery charger from Maha Energy Corp (mahaenergy.com). It can juice up AA and AAA NiMH and Ni-Cd batteries in either a fast- or a slow-charge mode. On fast-charge, the AAAs will take about 1 hour to recharge, and the AAs will be recharged in 100 minutes. The unit costs about \$50, but it will pay off in the long run compared with the cost of constantly having to buy alkaline batteries.

TOOLBOX

Tamiya decal scissors

Tamiya's incredibly sharp decal scissors are small and compact and are perfect for cutting out small intricate decals, stickers and masks. They're just 5 inches long, and their plastic handles fit your fingers nicely. The 1-inch blades are made of a high-quality stainless steel and are coated with a black finish that resists the stickiness of adhesives, so they don't get hung up when they're cutting. Tamiya decal scissors—item no. 74031; \$20. Tamiya America Inc. (800) 826-4922; tamiyausa.com.



NEED HELP?

Send your "Troubleshooting" questions and comments to troubleshooting@rcracing.com, or mail them to "Troubleshooting," c/o RC Car Action, 100 East Ridge, Ridgefield, CT 06877-4606 USA.

RC10-GT Steel Combo



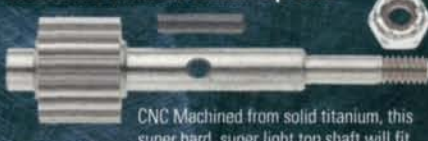
Precision machined from solid steel, then hardened, this 65T spur and 15T bell combo will last and last. RRP 2365

RC10-GT Hardened Steel Idler Gear



Cut from solid steel stock, this RC10-GT gear is lightened and hardened for super quiet precision and extra long life. Black tranny grease included. RRP 2213

Associated Titanium Stealth Top Shaft



CNC Machined from solid titanium, this super hard, super light top shaft will fit any Stealth transmission. RRP 1512.

RC-10GT Hardened Steel Clutchbells



These steel Clutch Bells are CNC machined from solid steel then the teeth are machined on. This makes the part stronger with less gear "run out". Available in 14T thru 20T, 22T and 24T. RRP 22XX

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Blue Lightened Slipper Kit



The rear plate is hard anodized and the front plate is color treated. The front plate holds the pad forcing it to slip on the rear plate. When pad wears, just flip it over for a new surface. RRP 1515 Associated

Hardened Diff Gear



Hard anodized, precision CNC machined aluminum diff gear. RRP 1513 RC10-GT

TC3 Ultra 48 Pitch Spurs



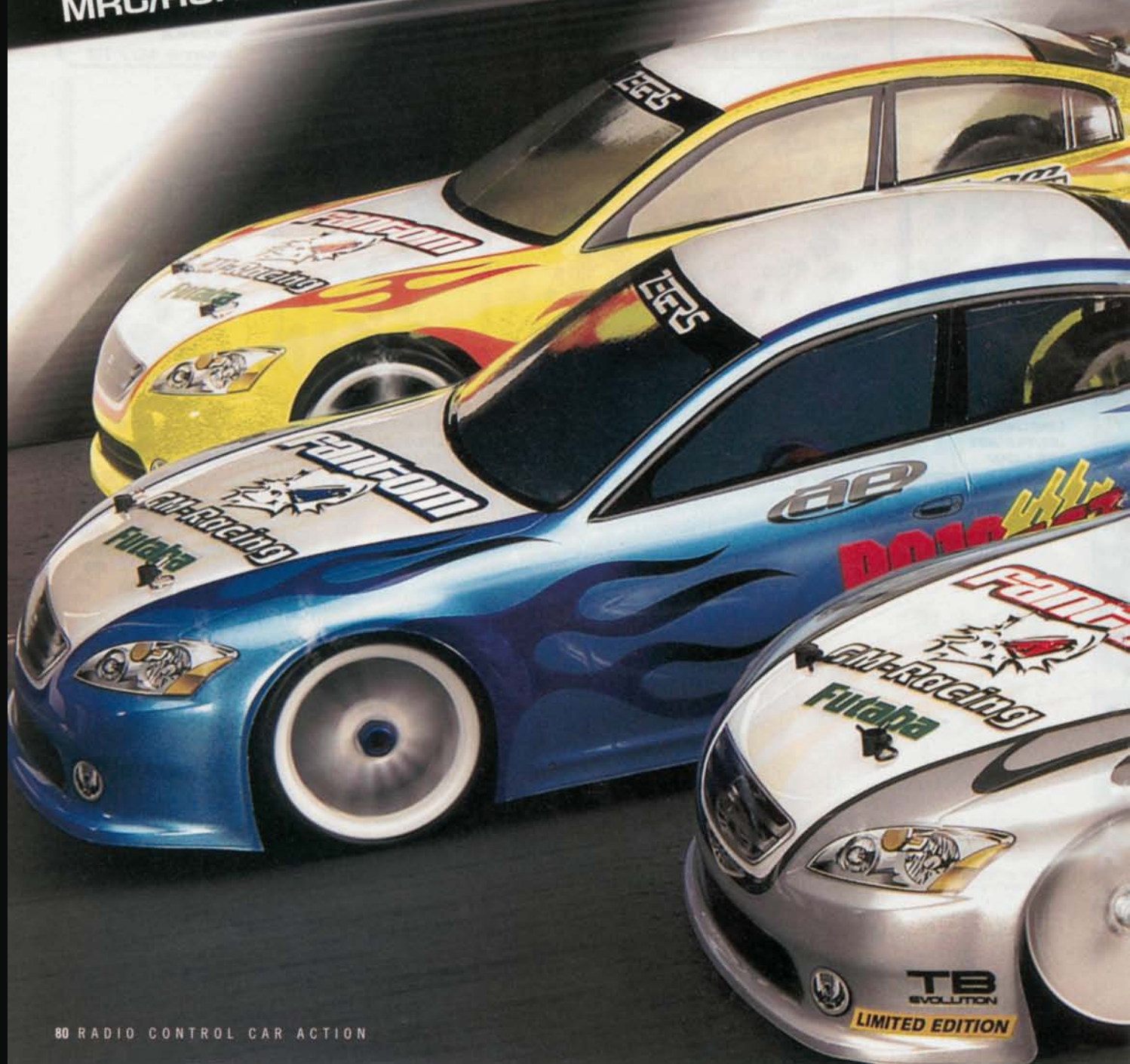
Precision machined from heat-resistant plastic, these spurs mesh flawlessly with our pinions. Available in even numbers from 70T thru 80T, RRP 1670 - RRP 1680.

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SHAFT-DRIVE

MRC/ACADEMY STR-4 PRO VS ASSOCIATED FACTORY



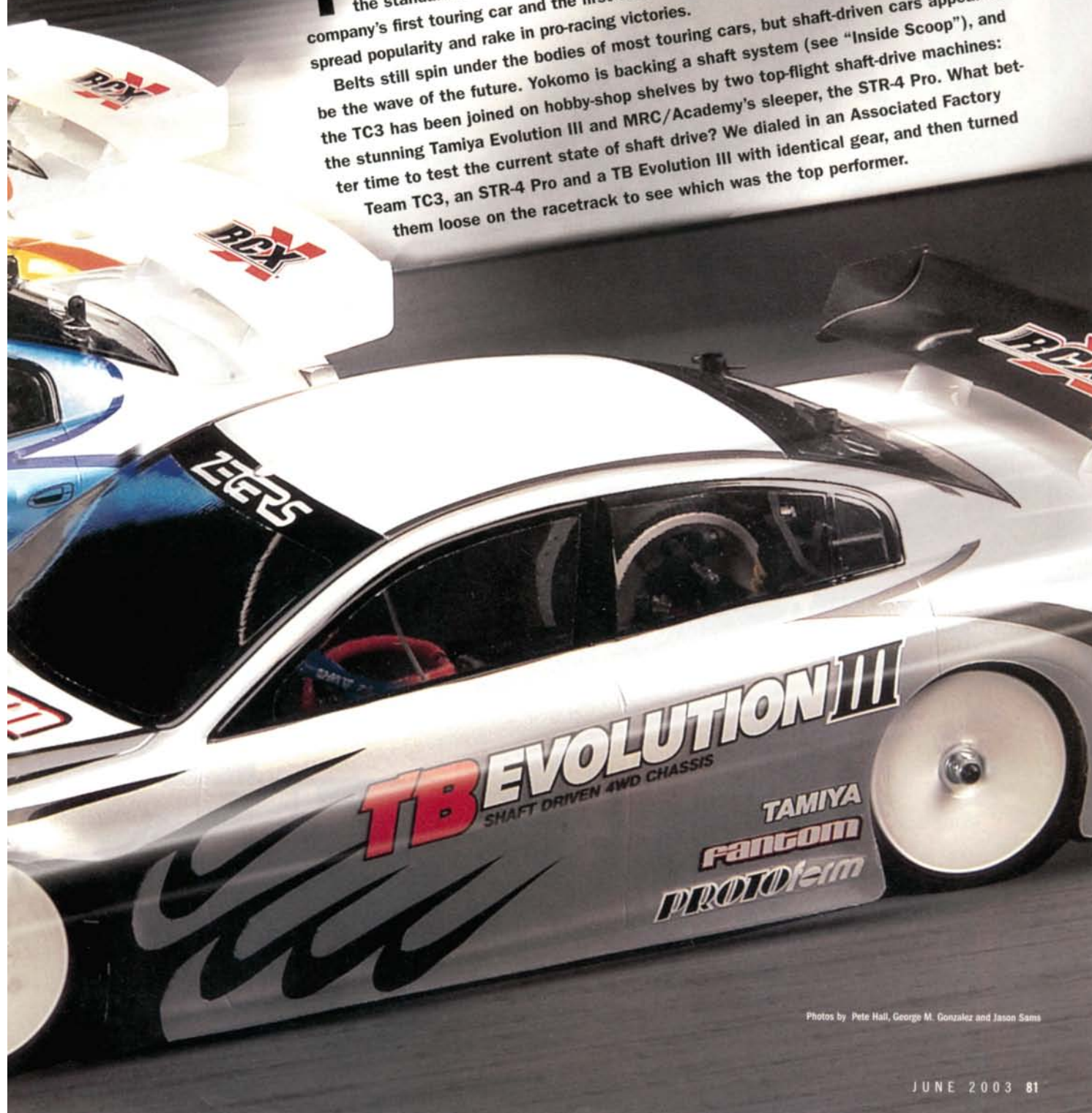
SHOWDOWN!

TEAM TC3 VS TAMIYA TB EVOLUTION III

by the RC Car Action team

Tamiya started the touring-car explosion with shaft drive, but it wasn't long before belts took over. Once the Yokomo YR-4 hit the scene with its dual-belt drive train, the standard was set—belts ruled. That is, until Associated launched the TC3: that company's first touring car and the first shaft-driven competition sedan to achieve widespread popularity and rake in pro-racing victories.

Belts still spin under the bodies of most touring cars, but shaft-driven cars appear to be the wave of the future. Yokomo is backing a shaft system (see "Inside Scoop"), and the TC3 has been joined on hobby-shop shelves by two top-flight shaft-drive machines: the stunning Tamiya Evolution III and MRC/Academy's sleeper, the STR-4 Pro. What better time to test the current state of shaft drive? We dialed in an Associated Factory Team TC3, an STR-4 Pro and a TB Evolution III with identical gear, and then turned them loose on the racetrack to see which was the top performer.

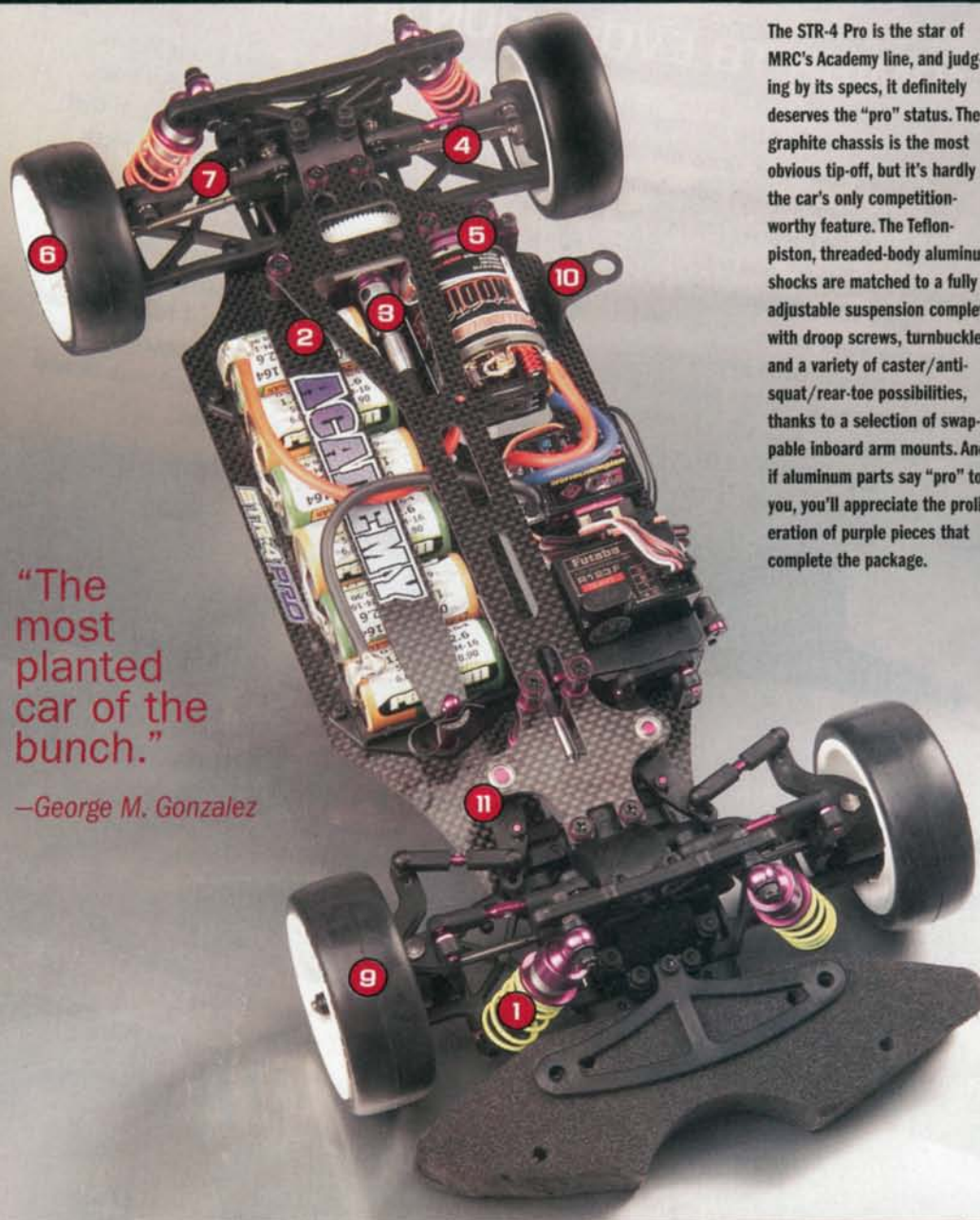


Photos by Pete Hall, George M. Gonzalez and Jason Sams

STR-4



FAST FACTS: PRICE (varies with dealer): \$220 WEIGHT, AS TESTED: 53.1 oz. (1,506g) REQUIRED TO COMPLETE ROLLING CHASSIS: body and pinion gear



"The most planted car of the bunch."

—George M. Gonzalez

The STR-4 Pro is the star of MRC's Academy line, and judging by its specs, it definitely deserves the "pro" status. The graphite chassis is the most obvious tip-off, but it's hardly the car's only competition-worthy feature. The Teflon-piston, threaded-body aluminum shocks are matched to a fully adjustable suspension complete with droop screws, turnbuckles and a variety of caster/anti-squat/rear-toe possibilities, thanks to a selection of swappable inboard arm mounts. And if aluminum parts say "pro" to you, you'll appreciate the proliferation of purple pieces that complete the package.

BRAGGING RIGHTS

1. Threaded-body aluminum shocks
2. 2mm graphite chassis
3. Quick-release, aluminum-tip graphite drive shaft
4. CV-style front and rear axles
5. One-piece aluminum motor mount/shaft-bearing block
6. Aluminum drive hexes
7. Aluminum turnbuckles
8. 6-spoke, 24mm wheels
9. Soft-compound tires with neoprene strip inserts
10. Transponder mount
11. Integrated servo-saver

Left: the STR-4 Pro's shocks are slick, and they're easy to adjust, thanks to their finely threaded bodies.

Center: the motor mount and shaft bearing block are machined out of one piece of aluminum. The clamping mechanism holds the motor-mount cam tightly.

Right: aluminum turnbuckles, CV-style universal joints, and aluminum drive hexes are all standard. Note the bellcrank bearings pressed into the chassis plates

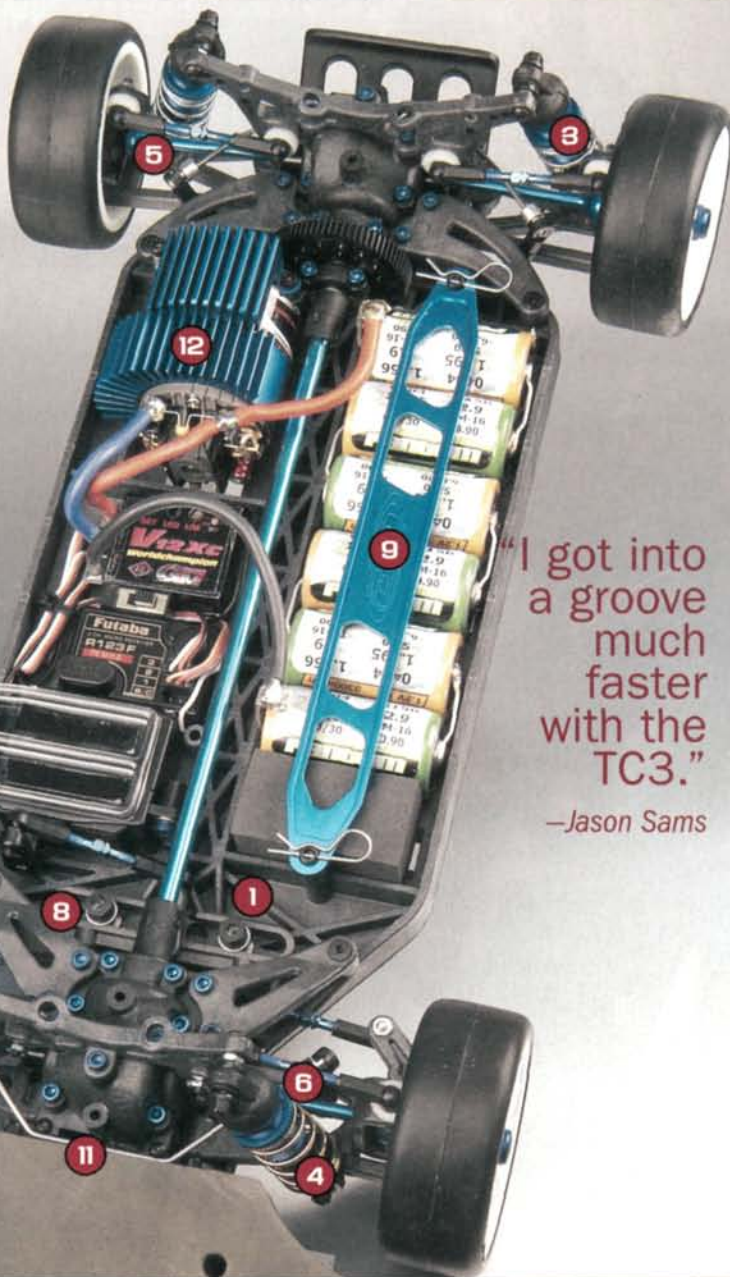




Associated Factory Team TC3

FAST FACTS: PRICE (varies with dealer): \$300 WEIGHT, AS TESTED: 52.5 oz. (1,490g) REQUIRED TO COMPLETE ROLLING CHASSIS: tires, wheels, body and pinion gear

The Team Associated guys were hardly the first to put shaft drive into a touring car, but it was the first major competition-car manufacturer to break away from belts. The Factory Team is at the top of the TC3 line and takes its name from the passel of parts that Associated pirated from its Factory Team aftermarket line, including all the available graphite/plastic composite parts. All the trick stuff is in the box, and the parts run the gamut of show (a blue-anodized battery brace and other baubles) and go (Unobtainium shock shafts, MIP CVDs and threaded shocks).



"I got into a groove much faster with the TC3."

—Jason Sams

BRAGGING RIGHTS

1. Graphite-plastic molded parts
2. Extra-hard, carbide-steel diff balls
3. Threaded-body aluminum shocks with foam volume compensators
4. Unobtainium, hard-coated shock shafts
5. Blue-anodized MIP CVDs
6. Factory Team titanium turnbuckles
7. Teflon-sealed ball bearings
8. Sliding-rack steering system
9. Factory Team aluminum drive shaft, battery strap, drive hexes and screw kit
10. Included dummy transponder
11. Front and rear swaybars
12. Finned motor mount and clip-on motor heat sink

Left: genuine MIP CVD axles, aluminum drive hexes, swaybars and threaded shocks—all standard.

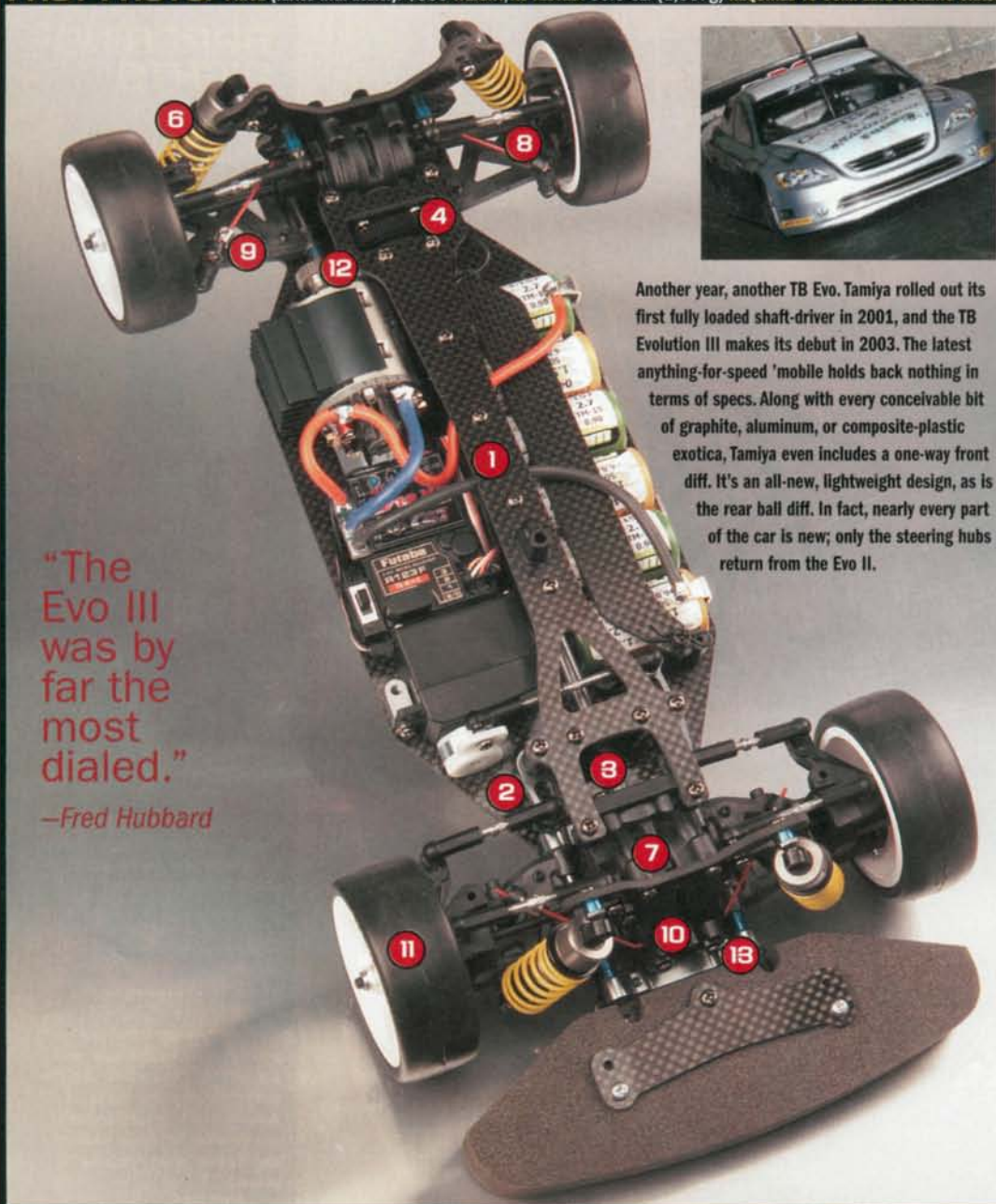
Center: Associated's rack-type steering system slides on ball bearings and delivers perfect Ackerman angles.

Right: titanium turnbuckles ward off crash damage and are lighter than steel. All the molded parts are made of Associated's graphite/plastic composite, which is stiffer and lighter than "regular" plastic.



EVOLUTION III

FAST FACTS: PRICE (varies with dealer): \$350 WEIGHT, AS TESTED: 55.3 oz. (1,567g) REQUIRED TO COMPLETE ROLLING CHASSIS: body



"The Evo III was by far the most dialed."

—Fred Hubbard

Another year, another TB Evo. Tamiya rolled out its first fully loaded shaft-driver in 2001, and the TB Evolution III makes its debut in 2003. The latest anything-for-speed 'mobile holds back nothing in terms of specs. Along with every conceivable bit of graphite, aluminum, or composite-plastic exotica, Tamiya even includes a one-way front diff. It's an all-new, lightweight design, as is the rear ball diff. In fact, nearly every part of the car is new; only the steering hubs return from the Evo II.



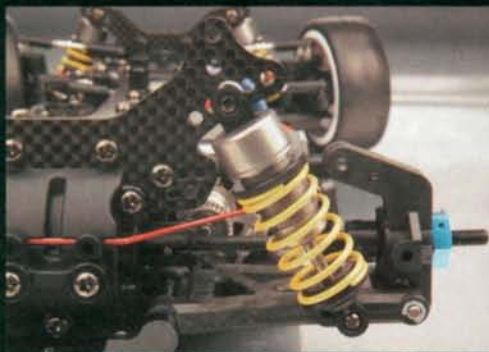
BRAGGING RIGHTS

1. 2mm graphite chassis
2. Machined-aluminum steering bellcranks
3. Aluminum drive shaft
4. Aluminum spur-gear hub accepts standard gears
5. Fluorine-coated shock shafts and shock bodies
6. Threaded-body aluminum shocks
7. Lightweight, one-way front differential and rear ball differential
8. CV-style steel drive axles
9. Graphite-plastic molded parts
10. Front and rear swaybars
11. Tamiya Type-A belted tires with molded inserts
12. One-piece aluminum-shaft bearing block/motor mount
13. Aluminum hinge-pin mounts

Left: Tamiya's fluorine-coated TRF dampers are works of art, and they operate without any detectable friction. A variety of swaybars are included with the kit.

Center: the Evo III's motor mount has been relieved of all unnecessary material. Note the large hole that allows the motor to sit low in the chassis.

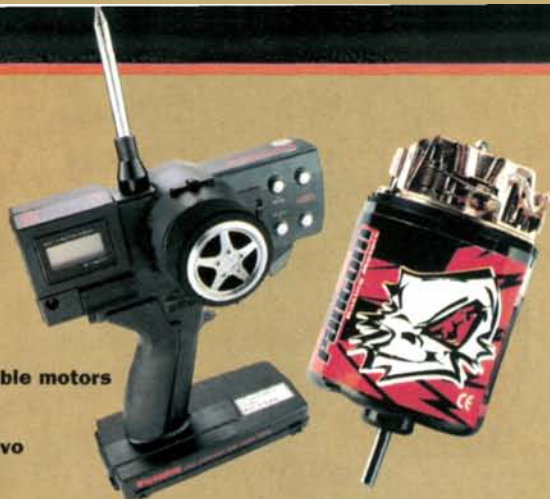
Right: like the TC3, the Evo III uses a combination king-pin/ball stud to articulate the steering arms. The extra hole in the C-carrier can be used to add a stiffening link.



CAR COMPLETERS

All three cars were built according to the supplied instructions and set up with identical equipment, with one exception: the pinion gears. Each car received a Robinson Absolute pinion, but the tooth counts were varied so that all three cars would have identical rollouts. Here are the other components that we used to finish off the test cars:

- Protoform Nissan Altima body
- Phantom GP3300 matched cells
- Phantom Team Stock and Factory Modified 10-double motors
- GM Racing V12Xc speed control
- Futaba 3PDF transmitter and S9304 steering servo
- Sorex 36R tires with firm inserts



MRC/ACADEMY STR-4 PRO

	N. Sava	F. Hubbard	J. Sams	G. Gonzalez	AVERAGE
Acceleration	8.5	7	7	7.5	7.5
Turn-in	8.5	5	8	8.5	7.5
Transitional handling	9.5	6	8	9	8.1
Corner speed	8.5	5	7	8.5	7.25
					AVERAGE: 7.6

ASSOCIATED FACTORY TEAM TC3

	N. Sava	F. Hubbard	J. Sams	G. Gonzalez	AVERAGE
Acceleration	9	8	8	8.5	8.4
Turn-in	9.5	7.5	9	8.5	8.6
Transitional handling	8.5	7.5	8	8	8
Corner speed	9	9	9	9	9
					AVERAGE: 8.5

TAMIYA TB EVOLUTION III

	N. Sava	F. Hubbard	J. Sams	G. Gonzalez	AVERAGE
Acceleration	7.5	8	8	8	7.87
Turn-in	9.5	8	8.5	9	8.75
Transitional handling	9.3	8	9.5	8.5	8.8
Corner speed	7	8	9	7.5	7.87
					AVERAGE: 8.3

ON THE TRACK

LAP TIMES	MRC/ACADEMY STR-4		ASSOCIATED FT TC3		TAMIYA TB EVO III	
	AVG. LAP	BEST LAP	AVG. LAP	BEST LAP	AVG. LAP	BEST LAP
Nick Sava	12.98	12.80	13.04	12.65	13.22	12.90
Jason Sams	13.42	13.16	13.19	12.83	13.03	12.70
George M. Gonzalez	14.45	13.70	13.49	13.02	13.90	13.80
Fred Hubbard	12.87	12.70	12.82	12.30	13.48	12.70



drivers' notes



nick

MRC/ACADEMY
STR-4

NICK SAVA: The STR-4 felt more planted than the other two shaft-drive cars, and that made it much easier to drive. It turned in nicely and never felt as if it was about to swap ends, even when pushed to the limit.



fred

FRED HUBBARD: The STR-4 didn't have that edgy, loose, feeling that I'm accustomed to, and it seemed to scrub off a lot of speed through the corners. I also felt that it did not transition through the switch-backs as quickly as the other cars. I'm sure that with some suspension tuning and the installation of a one-way front diff, I could get it dialed to my liking, though.



george

GEORGE M. GONZALEZ: Nick Sava and I agree that the STR-4 was the most planted car of the bunch. It was almost impossible to get it out of shape. It had plenty of on-power steering, and it transitioned extremely well through the twisties. It just did not get up to speed as quickly as the other cars, and lap times suffered slightly as a result.



jason

JASON SAMS: The STR-4 was stable and easy to drive, but it just didn't feel that fast, and that's shown by my lap times. It had noticeable chassis roll that helped provide tons of traction, but unfortunately, excessive chassis roll robs the car of precious cornering speed; swaybars would help. I agree with Fred that the car did not have the edgy feel that we are both accustomed to. The STR-4 Pro just needs a better setup; it can definitely go a lot faster.

ASSOCIATED
FACTORY TEAM
TC3

NICK SAVA: the TC3 out-accelerated the other two cars, and it felt as if it carried more speed around the track. It was very stable, but it didn't take much effort to break the rear tires free during cornering, so it felt a little twitchy when transitioning from corner to corner. Even so, the TC3 gave me the best lap times.

FRED HUBBARD: The TC3 accelerated quickly and definitely carried more speed in the corners than the other two cars. It had a slight on-power push, but it always kept a tight line coming out of the corners. It didn't seem as fast as the Evo III on the track, but the lap times told another story. I was the fastest with the TC3.

GEORGE M. GONZALEZ: The TC3's box-stock setup seemed the most suitable for the tight, technical SoCal track. Three of us logged our fastest lap times with the TC3. It was by far the easiest car to drive fast. It turned in well both on and off power, and it tracked through the high-speed sweeper without a wobble.

JASON SAMS: I got into a driving groove much faster with the TC3 than with the other two cars. Nick and I both noticed, however, that when we sent it hard into a corner, it had more of a tendency to suddenly break loose than its two competitors. Its "tight" feeling was a little sketchy in the 180-degree turns, but I welcomed this in the track's transitional areas, and it's why most of us put in great laps with this chassis.

TAMIYA
TB EVOLUTION III

NICK SAVA: In my opinion, the Evo III had the most on-power steering, and it seemed to transition better than the other two, but a lot of that has to do with its one-way front spool [the other cars were equipped with front ball diffs]. I just didn't think that it accelerated as quickly as it should. It felt a little over-geared, even though it had the same roll-out as the other cars.

FRED HUBBARD: Of the three cars I drove, the Evo III was by far the most dialed. It turned in well both on and off power, and that allowed it to transition much more quickly though the track's technical sections. The drive train felt as if it could be a little freer. The shielded bearings are packed with grease at the factory. Cleaning and re-lubing them with a light bearing oil will free up the drive train.

GEORGE M. GONZALEZ: The Evo III was the only one equipped with a front one-way spool, and that brought mixed reactions. Fred, who regularly races at SoCal, welcomed the one-way, but for me, that made the car a little nerve-wracking to drive. After I had dialed out some steering and adjusted the radio system's exponential to a negative value, I was able to get the car around the track with little difficulty, and I couldn't help noticing how quiet it was.

JASON SAMS: It took me a little time to get the hang of the Evo III because of its front one-way. After driving it for a couple of packs, I was able to power through the corners, and my lap times kept improving. I agree with Fred that it felt the most dialed—but only after I had adjusted to a no-braking driving style. I give this car credit for being absolutely planted.

specifications

	MRC/ACADEMY STR-4 PRO	ASSOCIATED FACTORY TEAM TC3	TAMIYA TB EVOLUTION III
FEATURES AND SPECS			
Wheelbase	255.5 to 259.5mm	258 to 260mm	254 to 260mm
Weight, as tested	53.1 oz. (1,506g)	52.5 oz. (1,490g)	55.3 oz (1,567g)
Width (F/R)	185/187mm	185/188mm	185mm
Front drive axles	Steel CV-style	Aluminum MIP CVDs	Steel CV-style
Rear drive axles	Steel CV-style	Aluminum MIP CVDs	Steel CV-style
Shock bodies	Threaded aluminum	Threaded aluminum	Threaded aluminum
Shock shafts	Plated steel	Unobtainium hard-coat	Fluorine-coated
Shock pistons	Teflon, one size	Teflon, three sizes	Teflon, two sizes
Turnbuckles	Aluminum	Factory Team titanium	Steel
Ball-bearing type	Metal shielded	Teflon sealed	Metal shielded
Transmission ratio	2.75:1	2.5:1	2.6:1
Differentials (no. of balls/outdrive material)	12/steel	12/plastic	12/plastic
Included spur gear(s)	62-, 65-, 67-, 70T	72T	90-, 96T
Wheels	6-spoke, 24mm	Not included	Dish, 24mm
Tires	Academy soft-compound	Not included	Tamiya Type-A belted
Inserts	Neoprene strip	Not included	Molded urethane
Body	Not included	Not included	Not included

CHASSIS AND SUSPENSION ADJUSTMENTS

Arm droop	Yes	Yes	Yes
Front toe	Yes	Yes	Yes
Front track	Yes	Yes	Yes
Front camber	Yes	Yes	Yes
Steering tie-rod positions (inner/outer)	2/2	1/1	1/2
Caster (deg.)*	5, 7.5, or 10	2 or 4	Adjustable**
Kick-up (deg.)*	5, 7.5, or 10	0 or 2	Adjustable**
Anti-squat (deg.)*	1 or 2	0 or 2	Adjustable**
Rear toe	1.5	2 or 3	3; adjustable**
Rear track	No	No	No
Rear camber	Yes	Yes	Yes
Front camber-link positions (inner/outer)	4/1	4/1	5/1
Rear camber-link positions (inner/outer)	5/2	4/2	5/2
Front shock positions (upper/lower)	4/2	3/2	3/2
Rear shock positions (upper/lower)	3/2	3/2	5/2

*Settings available with included kit parts.

**Optional, lettered hinge-pin mounts included to adjust arm angle/caster/anti-squat; settings in degrees not stated.

THE WINNER!

There are two ways to decide the winner of this contest, but the final decision is the same. If you look at the lap times, you'll discover that the TC3 was the fastest car for everyone except Jason. If you look at the numbers for handling traits, the TC3 has the highest average score. The TC3 is also a good deal at \$300, but you'll have to add the cost of wheels, tires and inserts to the bill; these are included with the Tamiya TB Evo III, which costs about \$50 more and is an extremely well-equipped car that only stands to go faster. If you're looking for a bargain, the MRC/Academy STR-4 Pro is a must-see. Dealer prices vary, but at around \$220, it's a real steal. Its out-of-the-box setup wasn't as fast as the Tamiya and Associated cars, but since it is a well-spec'd pro machine, there's no reason it can't be dialed in as well as those other rides. Look for a follow-up report on the STR-4 Pro from Nick Sava; he liked the car so much that he took it home!

SOURCE GUIDE

FANTOM RACING (269) 649-9583; fantom-motors.com.

FUTABA distributed exclusively by Hobbico/Great Planes Model Distributors Co. (217) 398-8970; futaba-rc.com.

GM RACING distributed by Horizon Hobby Inc. (217) 355-9511; horizonhobby.com; gm-racing.com.

MIP (626) 339-9007; miponline.com.

MRC/ALTECH (732) 225-6144; modelrectifier.com.

PROTOFORM INC. distributed by Pro-Line (909) 849-9781; pro-lineracing.com.

ROBINSON RACING PRODUCTS (209) 966-2465; robinsonracing.com.

TAMIYA AMERICA INC. (800) 826-4922; tamiyausa.com.

TEAM ASSOCIATED (714) 850-9342; teamassociated.com.



Trinity Reflex NT Team Only

HOW WOULD YOU LIKE TO OWN THE SAME CAR as factory driver Josh Cyrul drove to a second-place finish at the IFMAR Nitro Touring Car Worlds? Well, now you can, with the new, fully optioned Trinity Reflex NT "Team Only" kit. The package includes over \$450 worth of hop-ups and accessories, and it brings the car up to full factory-team specs. Rigid suspension components, a front one-way, a vented disc-brake system with machined-aluminum brake lever, aluminum hex adapters, front and rear swaybars and a Centax-style clutch are just a few of the in-the-box upgrades. Read on to get the full scoop on this hot, new racing chassis.

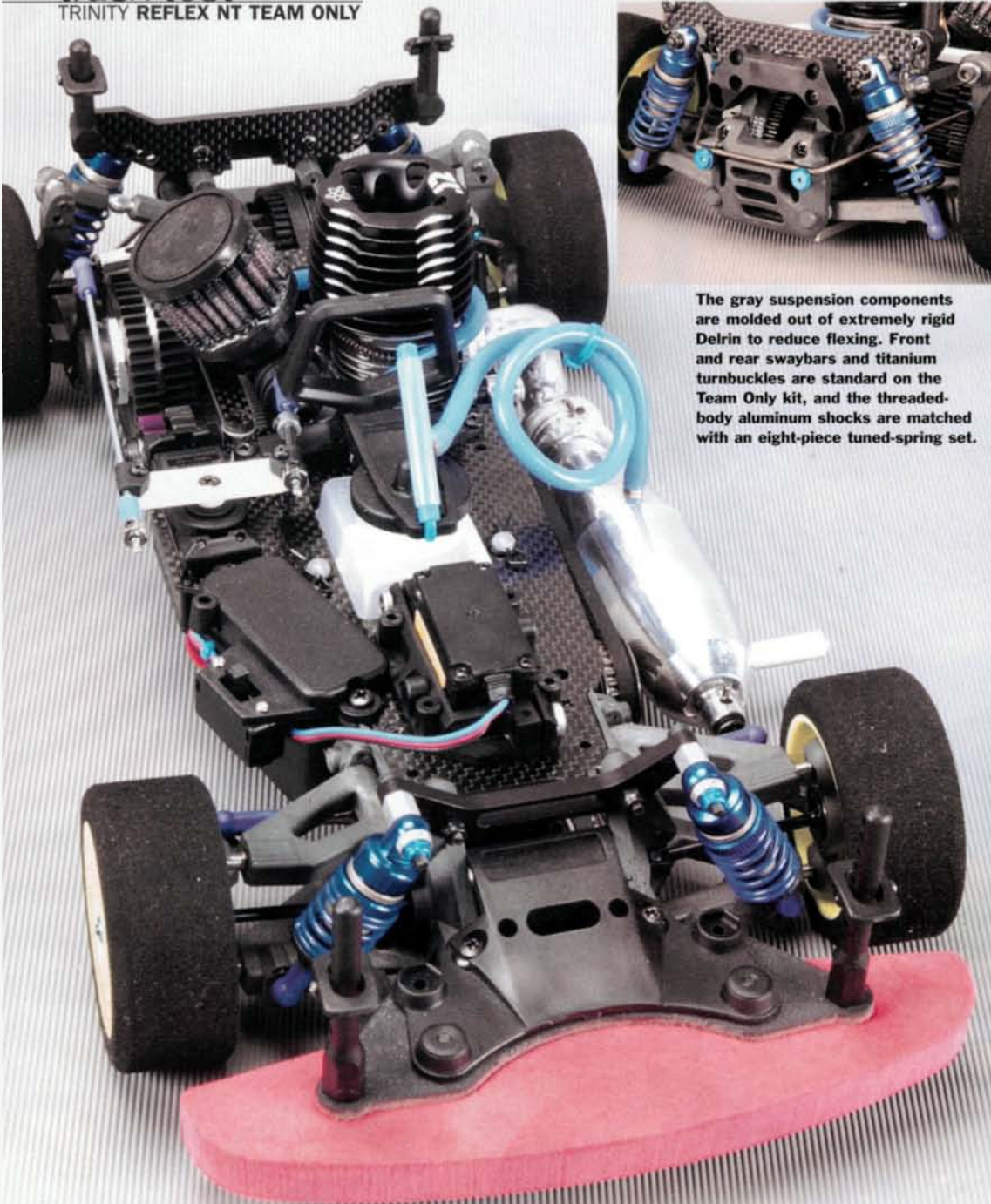
PHOTOS BY GEORGE M. GONZALEZ

**a factory ride
you can own**



track test

TRINITY REFLEX NT TEAM ONLY



The gray suspension components are molded out of extremely rigid Delrin to reduce flexing. Front and rear swaybars and titanium turnbuckles are standard on the Team Only kit, and the threaded-body aluminum shocks are matched with an eight-piece tuned-spring set.



DATA CENTER

VEHICLE TYPE 4WD nitro touring car
BEST BUYER Intermediate to experienced racers
KIT RATINGS (poor, satisfactory, good, very good, excellent)
Instructions Good
Parts fit/finish Good
Durability Very good
Overall performance Excellent

SPECIFICATIONS

MODEL Reflex NT Team Only
MANUFACTURER/DISTRIBUTOR Trinity Model Products
DISTRIBUTED BY Great Planes
SCALE 1/10
PRICE \$459
Varies with dealer

DIMENSIONS

Wheelbase 10.7 in. (273mm)
Width 7.9 in. (200mm)

WEIGHT

Total, as tested 65.5oz. (1,857g)

CHASSIS

Type Double-deck
Material (upper/lower) 2mm graphite/4mm machined-aluminum

DRIVE TRAIN

Type Triple-belt 4WD
Primary 17/21-tooth clutch-bell gears; 47/44-tooth spur gears
Transmission ratio 2.76:1 (1st gear)/2.1:1 (2nd gear)
Final drive ratio 6.95:1 (1st gear) 5.28:1 (2nd gear)
Drive shaft CVD axles
Differentials Sealed bevel-gear with one-way front pulley option
Bearing type Shielded bearings

SUSPENSION

Type (F/R) Upper and lower A-arm/lower A-arm with adjustable upper link
Damping Threaded-body aluminum shocks

WHEELS

Type Not included

TIRES

Type Not included

ENGINE AND ENGINE ACCESSORIES

Engine Not included
Exhaust Not included
Fuel tank 75cc

THE TEAM KIT FEATURES THE SAME 4MM-THICK, 6061 T-6 MACHINED-ALUMINUM CHASSIS AS THE STANDARD REFLEX.

The 4mm-thick machined-aluminum chassis is extremely rigid and looks fantastic. The fuel tank is mounted in the center of the chassis so that the car's weight bias will not be affected as the fuel is used. The 5-cell receiver pack is taped to a graphite plate installed underneath the chassis.



KIT FEATURES

CHASSIS. The Team kit features the same 4mm-thick, 6061 T-6 machined-aluminum chassis as the standard Reflex. The chassis screw holes are completely countersunk and the chassis' jewel-like beveled edges not only look good but also prevent the chassis from scraping the track while cornering. Machined cutouts reduce weight without sacrificing rigidity, and a graphite battery tray slides like a cassette into an opening in the center of the chassis. A 2mm graphite upper deck houses the steering and throttle servos, the receiver box and a low-profile 75cc fuel tank.

DRIVE TRAIN. The Team car uses a proven 3-belt drive train. To reduce friction, the entire system (including the wheel axles) spins on metal-shielded bearings, and the drive belts mesh with hard-anodized-aluminum drive pulleys. A rear O-ring-sealed bevel-gear differential is standard, and it can be filled with thick silicone diff fluid of various viscosities to tune diff action. The Team also includes a front one-way diff. CV-style drive shafts at all



The Centax clutch can easily be adjusted without removing any parts, the 2-speed tranny features a 3-shoe clutch for smooth engagement, and the wide 2-speed spur gears look as if they'll last a long time. The extra-long aluminum brake lever gives the brake servo more leverage to yank on the binders. The Team Only kit includes a sweet, vented and polished brake rotor.

corners transfer the power to the wheels, and aluminum wheel hexes are also standard.

Steel calipers with fiber brake pads clamp down on a vented-steel brake rotor, and a machined-aluminum brake lever gives the throttle/brake servo more leverage to squeeze the binders. Three clutch shoes inside a 2-speed housing provide smoother shift engagements than a "finger-type" mechanism can, and the system holds on to shift-point settings extremely well.

SUSPENSION AND STEERING. Pivot balls are used to attach the front steering hubs to the upper and lower front suspension arms. Pivot balls are also used to attach the bottom of the rear hub carriers to the suspension arms, while titanium turnbuckles link the upper tops of the hub carriers and the rear shock tower. Camber, toe-in and subtle width adjustments are possible at both ends of the car. Additionally, front caster may be adjusted by sliding the upper front suspension arms forward or rearward on the hinge pins. Clip-on spacers make it easy to adjust caster accurately.

To reduce unwanted suspension flex, the Team car's suspension arms are all molded of fiber-reinforced nylon—an ultra-rigid composite. Setscrews threaded into the suspension arms allow droop adjustment. Adjustable front and rear swaybars are also included to reduce chassis roll. A blade-type front swaybar with CNC-machined aluminum mounts and a standard piano-wire rear swaybar are also included to reduce chassis roll.

Silky-smooth, threaded-body aluminum shocks damp the suspension and are equipped with machined Delrin shock pistons for smoother, more consistent performance; an eight-piece tuned-spring set is supplied to enhance shock-tuning options. Front and rear shock towers with additional upper shock-mounting options are also included. The thick, black-anodized-aluminum front shock tower and woven-graphite rear shock tower with three upper shock-mounting locations are Team Only exclusives.

A molded clamp secures the vertically mounted steering servo to the upper deck, and titanium turnbuckles link the steering hubs directly to the servo-saver.

BUILDING & SETUP TIPS

SUPPLEMENTAL INSTRUCTIONS. Read the entire assembly manual and all of the supplemental instructions before you start to build the car. Make notes in the manual where you'll have to turn to the supplemental pages to complete certain steps.

THREAD-LOCKING COMPOUND. Use medium-strength thread-lock on all the machine screws that thread into metal; you'll then be able to remove the screws for maintenance without stripping the heads.

BAG D, STEP 1. Take your time when you thread the 4x8mm setscrews into the front and rear suspension arms. Apply a little beeswax or silicone oil to the threads to help the setscrews thread into the suspension arms.

BAG E, STEP 2. If the front suspension arms do not pivot smoothly on the hinge pins, you'll have to ream the suspension arms' hinge-pin holes with a 3mm reamer.

BAG F, STEPS 2 AND 3. Use a crescent wrench to tighten the large nuts that secure the spur gears to the flanges in the 2-speed clutch housing. Trinity offers a Reflex NT 2-speed gear wrench that makes the task really easy.

BAG H, STEP 1. The stock Reflex NT has a molded middle layshaft mount (item no. 40255) that, in the Team Only version, has been replaced by two aluminum bearing blocks. The supplemental instructions do not tell where these should be installed. These pieces are in the supplemental hop-up bag labeled with an "H." The blocks also have a mount to which the pipe hanger has to be attached.

BAG K, STEP 2. There are two ways to mount the steering servo on the upper deck: with the supplied clamp-type assembly or with the two no. 40259 servo mounts (also supplied). If you use the clamp-type assembly and notice that you are able to push the servo down with your thumb after you've tightened the clamping screws down all the way, use the conventional servo mounts. If the steering servo moves around on the clamp, it will mess up the steering geometry and cause bump-steer.

INCLUDED HOP UPS & ACCESSORIES

The NT Pro comes equipped with more than \$450 worth of hop-ups that are not included with the feature-packed Reflex NT. These are the same parts as the Trinity racing team use, and they're available separately to bring a standard Reflex up to full team spec. Here's a list of all the extras that you get with the NT Pro.

- Centax-style Clutch—item no. 2506; \$27.50
- Aluminum brake lever—2505; \$20.99
- Vented-steel brake rotor—2063; \$5.99
- Special composite:
 - > upper/lower, F/R suspension arms—NT2120C; \$25.99 each
 - > bulkheads (F/R)—NT2053C/NT2061C; \$11.99 each
 - > front knuckle and rear upright set—NT2055C; \$21.99
- Delrin shock pistons—2520; \$7.99
- 8-piece tuned spring set—2516; \$18.99
- Rear swaybar—2511; \$27.50
- Front blade-type swaybar—2509A; \$65.99
- Aluminum:
 - > front swaybar mount—2509; \$44.99
 - > front shock tower—not available; \$29.99
 - > hex hub adapters—2504; \$22.99
 - > center layshaft mount—2512; \$31.50
- Pivot-ball upper shock mounts—2519; \$7.99
- Low-CG engine mounts—2524A; \$24.99
- Big Bash foam bumper with revised body posts—2517; \$9.99
- Front one-way diff pulley—2500; \$55.99
- Total cost of option parts if purchased separately: \$475.34

YOU'LL NEED

- Radio system and steering and throttle servos
- Engine
- Tuned pipe
- Fuel
- Glow Igniter
- Body
- Wheels and tires
- 3x2-cell receiver pack

According to these numbers, buying a "Team Only" Reflex NT for \$459 is like buying all the hop-up parts separately and getting the rest of the parts required to build the car for free—and then getting \$16 back from Trinity! Sounds like a deal to me.

track test

TRINITY REFLEX NT TEAM ONLY

ENGINE AND ENGINE ACCESSORIES. The Team kit doesn't include an engine, but it does include the necessary hardware to install a powerplant with a pilot-shaft crank. A Centax-style clutch that uses balls instead of conventional clutch shoes is included, and the Sirio Nitro Racing .12 that I used for testing dropped right in. The Centax-style clutch is extremely easy to build, and you can adjust its engagement point externally. Finned,

low-center-of-gravity (CG) engine mounts are also included to allow the engine to be installed as low as possible on the chassis.

BODY, WHEELS AND TIRES. The body, wheel and tire choices are left up to you. This is appropriate considering that the NT Team Only is a full-blown racing chassis.

PERFORMANCE

I decided to test the Team car at the huge, outdoor, on-road KZ Speedway track (Sun Valley, CA), which happens to be my local track. It allows some super-high-speed racing, so it's one of my favorites. I ran the same car as assistant editor Jason Sams set up and used for the Performance Test that was published in the June issue of *RC Nitro*; I did, however install a front diff in place of the one-way pulley.

I immediately felt comfortable with the car's handling. It had a slight on-power push that was easy to overcome by letting off the throttle momentarily before entering tight corners and then getting back on the pipe. Through the corners, the car held a tight line, so it was easy to drive fast.

The power that the Sirio engine produces is nothing short of amazing. No other car on the track could keep up with mine on the 200-foot back straightaway (that includes an 1/8-scale on-road car that was roaming around at the same time). The Team Only handled its power really well, although a careful throttle finger was required to avoid overshooting the corners or completely looping out when exiting them under power. The upgraded disc-brake system worked extremely well. I could easily lock up the tires in a panic stop to avoid a collision, and I never noticed any fading, even after 30 minutes of hard driving.

I was amazed to discover that my lap times were consistently 24 and 25 seconds—virtually identical to those I log with the car I race every weekend and with which I have had much more tuning time! If it's this good out of the

box, it can only get better with some dial-in time.

THE VERDICT

The NT Team Only is essentially the same car as Team Trinity driver Josh Cyrul used to finish in second place in the A-main at the IFMAR Nitro Touring Car Worlds. Just about every performance-enhancing option part that Trinity offers for the car is in the kit. The Team car was just as fast on its first outing as the car that I've been racing and perfecting for months; this tells me that the designers and team members did their homework when they designed the original Reflex and spec'd the Team version. If you can't win with this car, you have a problem with your driving!

THE POWER THAT THE SIRIO ENGINE PRODUCES IS NOTHING SHORT OF AMAZING.

LIKES

- Super-thick machined-aluminum chassis and graphite upper deck.
- Centax-style clutch.
- Stiff suspension components.
- Excellent handling and highly tunable chassis.

DISLIKES

- Instructions could be more thorough.
- Should include rubber-sealed bearings instead of shielded bearings.

SOURCE GUIDE

AIRTRONICS (714) 978-1895; airtronics.net.
SIRIO distributed exclusively by Trinity Products Inc.
TRC distributed by Trinity Trinity Products Inc.
TRINITY (732) 635-1600; teamtrinity.com.



Airtronics M8 transmitter

The NT Team Only is designed for racing, and a feature-filled radio system is required to exploit the chassis' potential. I reached for my tried-and-true Airtronics M8 radio to test the NT Team Only. Nitro-specific components such as a start-up feature that advances the throttle slightly to help start the engine when it's cold and anti-lock brakes that smooth the braking action make the M8 a solid choice for any nitro vehicle.



Additional items used

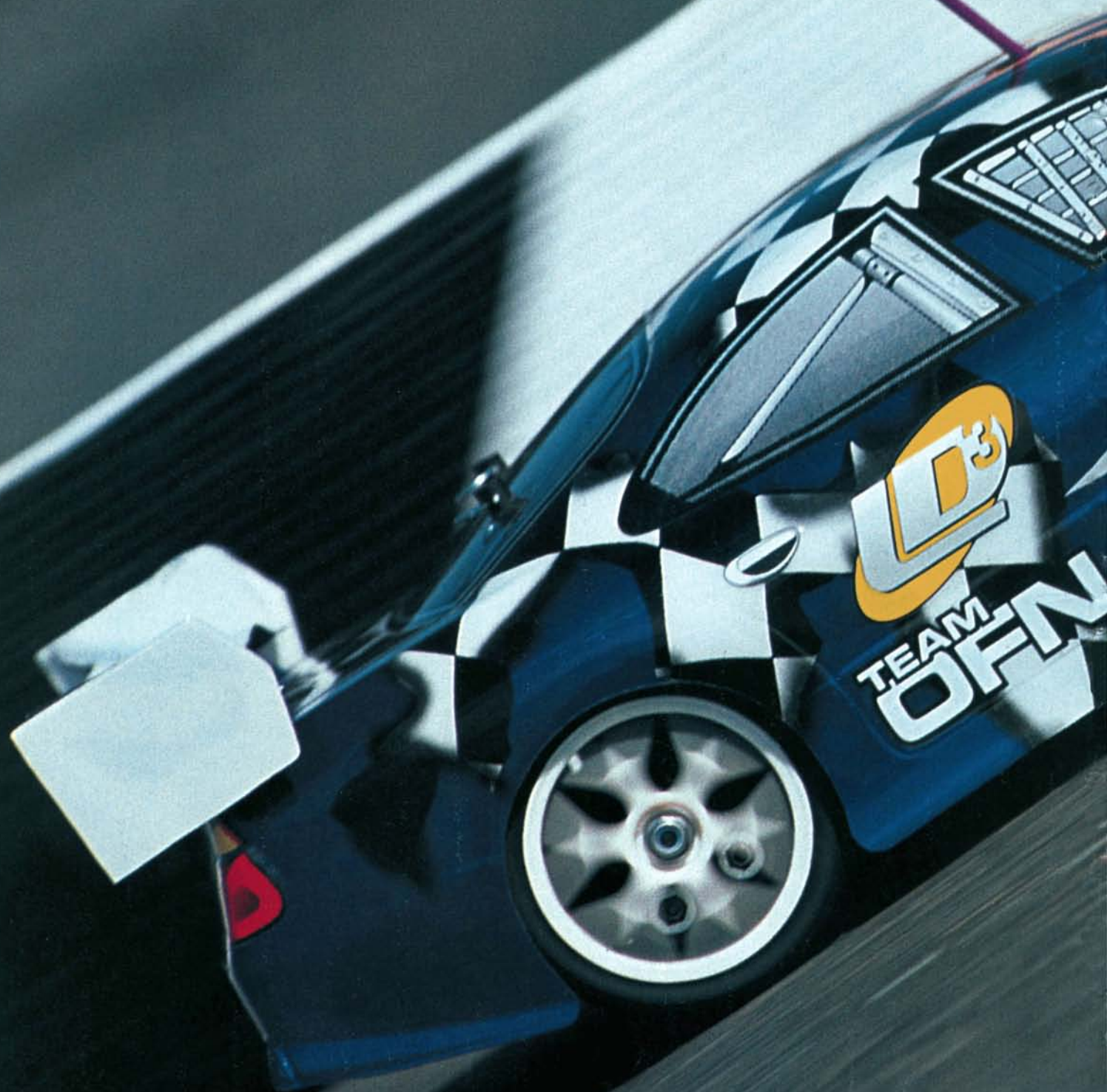
- Airtronics 94755 digital high-speed steering and throttle/brake servos**
- Trinity 20%-nitro Monster Horsepower fuel**
- Trinity NiMH receiver pack**
- Sirio Nitro Racing .12 engine**
- Trinity Reference 200mm Nitro Rocket body**
- TRC Double Purple front and Purple rear foam tires (26mm)**
- Trinity/Team Magic one-piece tuned pipe**

THE COMPETITION

MODEL	CHASSIS	DRIVE TRAIN	DRIVE AXLES	2-SPEED	SUSPENSION	BODY	TIRES	PRICE*	REVIEWED
Associated Nitro TC3 Team	2.5mm stamped	Shaft	MIP CVDs	Clutch-type	Pillow ball	None	Rubber	\$269	05/02
Kyosho V-One RR	3mm machined	3-belt	Universal joint	Fingers-type	Pillow ball	Stratus	Foam	\$399	RC Nitro 09/01
Mugen MTX-3	3.18mm machined	3-belt	Dogbones	Clutch-type	Pillow ball	None	Foam	\$369	04/03
GS Racing Vision Pro	4mm machined	3-belt	Universal joints	Clutch-type	Pillow ball	Stratus	Foam	\$309	RC Nitro 12/02
Trinity Reflex NT Pro	4mm machined	3-belt	CV-type axles	Clutch-type	Pillow ball	None	None	\$459	06/03

Partial list; does not include all competitive vehicles. *Price varies with dealer.

OFNA LD3



PHOTOS BY PETE HALL



READY-TO-RUN SHAFT SHIFTER

OFNA HAS HAD A GOOD RUN WITH ITS OB-4 SERIES OF BELT-DRIVEN TOURERS, but if the new LD3 is any indication, the future of OFNA sedans is shaft-drive. The new design gets the broad strokes of its chassis layout from the Associated Nitro TC3, but OFNA's sedan separates itself with many unique details, most notably the O-ring-sealed gear differentials at each end of the aluminum drive shaft.

The LD3 will be offered in three versions: a pro-level kit, a single-speed ready-to-run and a ready-to-run with a 2-speed transmission, integrated fail-safe and pull-start Force .12 engine; we test that version here. Like all of OFNA's RTRs, the LD3 is set up with Airtronics radio gear and a factory-finished body, and it's ready to roll on glued tires. A glow starter, spare glow plug and fuel bottle are in the box, too, and that means it won't take me any time at all to get the LD3 onto the track.



There are three Ackerman options on the steering arms, but the expected sliding-upper-arm caster adjustment isn't part of the LD3's tuning package.



DATA CENTER

VEHICLE TYPE 4WD RTR nitro touring car

BEST BUYER Performance-oriented nitro sedan fans

KIT RATINGS (poor, satisfactory, good, very good, excellent)
Instructions Good

Parts fit/finish Very good

Durability Very good

Overall performance Very good

SPECIFICATIONS

MANUFACTURER OFNA

MODEL LD3 RTR

SCALE 1/10

PRICE \$330 (varies with dealer)

DIMENSIONS

Wheelbase 10.3 in. (262mm)

Width (F/R) 7.8 in. (199mm)

WEIGHT

Total, as tested 65.6 oz. (1,861g)

CHASSIS

Type Double-deck plate

Material 2.5mm aluminum/plastic

DRIVE TRAIN

Type Shaft-driven, full-time 4WD

Transmission Clutch-type, 2-speed

Drive shafts (F/R) CV-type/dogbone

Differentials O-ring-sealed bevel gear

Bearing type Rubber-sealed ball bearings

SUSPENSION

Type (F/R) Upper/lower wishbone
camber link

Shocks Plastic-body, oil-filled dampers with clip-on preload spacers

WHEELS

Type One-piece plastic, "mesh" pattern

TIRES

Type Treaded rubber with foam insert

ELECTRONICS

Transmitter Airtronics Blazer

Servos Airtronics 94102

ENGINE AND ACCESSORIES

Engine Force .12 side-exhaust, pull-start

Manifold Bolt-on, tubular

Pipe Ringed-type, aluminum

Fuel tank 75cc with internal filter



Left: there's a gear diff hiding in that compact housing, and it's spun by steel ring-and-pinion gears.

Right: the rear hubs use pivot balls for toe-in adjustment and turnbuckles to set camber.



A FULLY COUNTERSUNK ALUMINUM STAMPING FORMS THE LD3'S CHASSIS.

KIT FEATURES

CHASSIS. A fully countersunk aluminum stamping forms the LD3's chassis. The sides of the 2.5mm-thick chassis are radiused to increase its rigidity, and a variety of openings has been cut in the underside. With the exception of clearance openings for the pull-starter and flywheel and a fuel-escape hole, the chassis cutouts appear to be mostly for style. The chassis is also slightly asymmetrical; the right side is wider to accommodate the radio gear that's stashed in individual, lidded boxes for the receiver and receiver battery. The left side of the chassis is narrower, which snugs the engine up against the drive shaft so the exhaust system can fit under the body properly.

DRIVE TRAIN. A 5mm aluminum shaft is the heart of the LD3's drive train, and it connects the front gearbox to the aft-mounted 2-speed transmission. The clutch-style unit shifts more smoothly than drive-dog-style mechanisms, and its shift point is fully adjustable. The LD3's single-rotor disc brake is mounted on the same shaft as the 2-speed. The vented-steel rotor floats on a pair of drive pins, and it's squeezed by a padded steel caliper.

The shaft drive and 2-speed system unload into front and rear gear differentials with steel ring-and-pinion gears. The diffs are four-gear units (two spider gears and two output gears) and use O-ring seals to keep silicone fluid in (if you choose to clean out the factory grease in favor of a goo-job). When the LD3 Pro arrives, it will have six-gear diffs, which will be offered as an option for the LD3 RTRs.

Shims between the diffs and their bearings adjust the pinion/ring gear mesh, but as shimmed from the factory, the pinion/ring gear mesh felt notchy. OFNA reassures me that the gears will wear in after the first few runs, so I left the shims in place. We'll see how they feel after I run a few tanks through the car.

A pair of chrome-plated steel, CV-style universal-joint axles sends power to the front wheels, and steel dogbones do the same job in the rear. Rubber-sealed ball bearings are standard.

SUSPENSION AND STEERING. Up front, the LD3's pivot-ball system has the usual features. Aluminum retainers are threaded into the steering arms to capture the pivot balls, and plastic cups fit between the retainers and balls to keep the action smooth. The lower arms are outfitted with droop screws, but caster is fixed at 10 degrees. Pivot balls outfit the rear suspension as well, but only



Left: a clutch-type 2-speed and a vented-steel disc brake provide the "go" and the "whoa."

Below: the Force .12 pull-start engine ran well (with a dab of sealant), but style points are subtracted for the painted heat-sink head.



Steering is handled by a reversed-bellcrank setup that's patterned closely after the TC3's, complete with a cam-type servo-saver. Steel turnbuckles reach out to the steering knuckles, and the linkage that joins the servo to the bellcranks is also a turnbuckle.

ENGINE AND ACCESSORIES. OFNA has relied on Force .12 engines for many of its vehicles, and that's what you'll find here. A 2-needle slide carb sends the fuel/air mixture on its way through the 3-port sleeve and out through the side exhaust, where it leaves the LD3 via a tubular manifold and a ringed-aluminum tuned pipe. Three clutch shoes are parked under the steel clutch bell, which spins on a pair of ball bearings and uses thread-on gears.

The engine is fed by a low-profile fuel tank that is shaped to sneak under the drive shaft. The 75cc tank has a cap-mounted pressure tap to reduce fuel foaming and an internal filter to keep any junk that finds its way into the tank out of the engine. And to keep fuel off the chassis, a spillway is molded into the tank and guides spillage down and out of the car.

BODY, WHEELS AND TIRES. The LD3's body is styled after Chrysler's 300M, and it's decked out with flames over a tear-away checkerboard pattern that is screen-printed on the body. Decals are used to create the look of windows; they look good, with roll-cage and window netting details, but the cooling hole in the windshield really jumps out at you.

OFNA specs a play-friendly tire setup for the LD3. The tall-sidewall tires are treaded, and they're molded of a firm-ish rubber that should last a long time, compared with low-profile racing rubber. The tires are glued to "mesh"-pattern wheels, and soft foam inserts help them hold their shape.

ELECTRONICS AND ACCESSORIES

AIRTRONICS BLAZER 27MHZ RADIO SYSTEM

Like all OFNA RTRs, the LD3 comes with an Airtronics Blazer setup. The transmitter is strictly no-frills, with servo-reversing, trim dials and an LED battery meter as its only features—unless, of course, you don't count "reliability" as a feature. The Blazer might not be an exciting piece of hardware, but it is a pistol you can count on to keep you in control.

AIRTRONICS 94102 STEERING AND THROTTLE SERVOS

The 94102 is Airtronics' base-model servo. This plastic-gear unit is good for about 40 oz.-in. of torque, and it's a good match for steering and throttle duties in a parking-lot play machine such as the LD3.

INTEGRATED FAIL-SAFE UNIT

This electronic device automatically sets the throttle servo to neutral or full brake (you decide which setting) in the event of signal loss, interference, or a low receiver battery. OFNA built the fail-safe into the LD3 receiver's battery-box lid, but our preproduction car had only a mock-up fail-safe, so we couldn't test this feature.

OFNA GLOW STARTER, FUEL BOTTLE AND CARRYING BAG

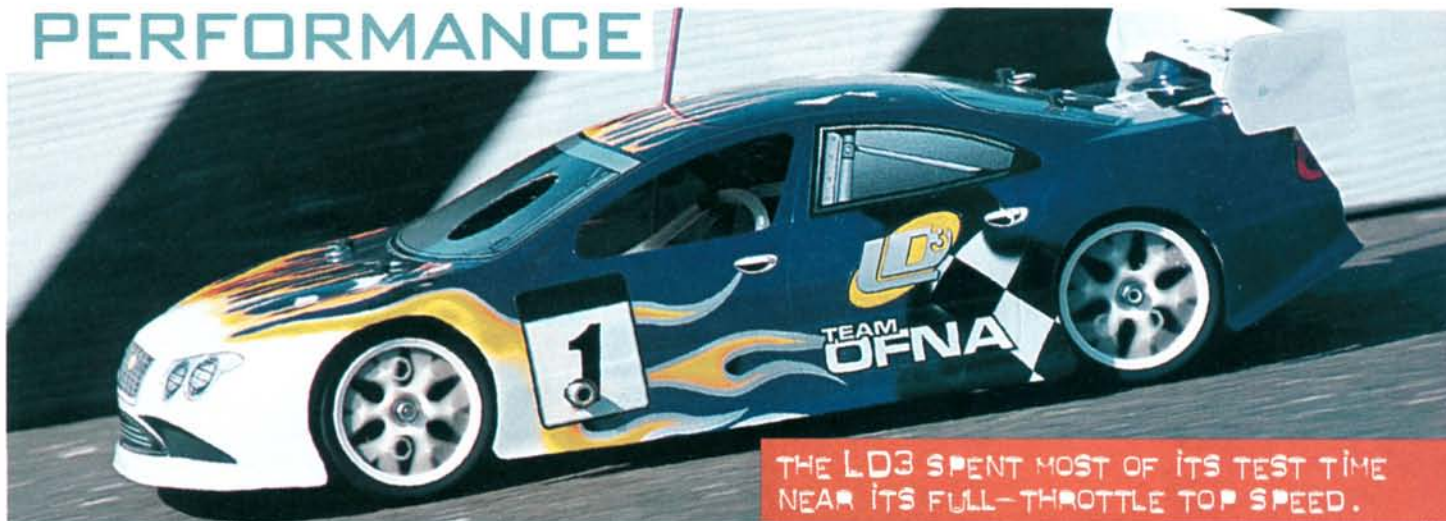
Today's RTRs are great values, but none are what you could call "cheap." After ponying up for the big box o' fun, finding an extra \$20 or so for a glow starter and fuel bottle can be a real buzz kill, so it's good to see them included as standard equipment. The plastic glow starter takes a C-type alkaline battery, and the aluminum-spout fuel bottle squishes easily for quick fill-ups. A nylon bag is included to help you get your gear to the parking lot. Two heavy-duty cardboard boxes inside the bag have enough room for the car, your transmitter, the glow starter, a fuel bottle and a few essential tools.

YOU'LL NEED

- 12 AA batteries
- One C battery
- Fuel



PERFORMANCE



As required with any nitro car, I broke in the LD3's Force engine with a few rich tanks of fuel before tearing into the throttle trigger. I had no trouble firing up the engine, but it didn't want to idle well, and the needle settings seemed to drift at random; that made me suspect an air leak. After I put a little sealant on the carburetor neck, the performance improved, and it ran as reliably as the Force .12s I've run in other OFNAs.

With the engine fully broken in and running well, I made a few standing-start launches to see what the LD3 could do in a parking-lot drag race. The engine quickly cleared out and hustled the LD3 down the lot as fast as any other RTR nitro tourer I've driven, but the shift into second gear was a little late and required more revs than I like to subject an engine to. No worries; I rolled the LD3 in, tweaked the 2-speed's adjustment screw and then made another pass. After two more twists, I had the shift point just where I wanted it, and the LD3 was snick-ing into second gear just before the engine revved out of its powerband.

A wide-open parking lot encourages a wide-open approach with the throttle, and the LD3 spent most of its test time near its full-throttle top speed of 50.1 mph. I can't count the number of tire-scalding, speed-run-into-a-power-slide passes I made across the parking lot, but there were enough to wear the outer tread bars off the tires. The LD3 was totally predictable when it broke traction, and it drifted easily with the correct balance of throttle and steering input.

In closer quarters, the LD3 handled like a typical full-time 4WD tourer, with the usual understeer handling traits when pushed hard into corners. A nudge of the disc brake helped move the car more tightly through the turns, and transitional handling was very good, especially for a car without swaybars running on tall-sidewall tires. Although the brake was effective for scrubbing speed, it lacked "feel" for hard stopping; it was difficult to sense when the wheels were about to lock, but this has as much to do with tires as it does with the brake system. Rest assured, wheel-locking power is on tap, and you'll always be able to stop.

Using "durability testing" as an excuse for abuse, I gave the LD3 some rally-style air time with launches over the beveled curbs that permit sidewalk access to the parking lot. The chassis took some serious scrapes, but the suspension didn't mind the hacking. After nearly an hour of running, I remembered to check up on those diffs; they still had a little growl in them, but they had smoothed out significantly. A few more tanks, and they'll be fine.

THE VERDICT

In ready-to-run trim, OFNA's LD3 is a very complete package for first-time nitro fans, yet there are technical details aplenty to keep the more experienced enthusiasts enthusiastic. With appropriate tires, the LD3 could also be an easy way to get started in racing—especially if the local track is a stickler for .12 engines. But the parking lot is really where it's at. With a trouble-free, shaft-drive system and all-around toughness, the LD3 can burn away an afternoon as easily as it burns nitro fuel.

LIKES

- Glow starter and fuel bottle included.
- Seamless shifts via a clutch-type 2-speed.
- Built-in fail-safe.

DISLIKES

- Gears are notchy when new.
- Painted heat-sink head.
- Decals for windows.

Byron Race 2500 fuel

Ask the hobby-shop guy if Byron fuel is any good, and he'll probably tell you that Team Mugen used it to take first, second and third at the On-Road Worlds. And if he really knows his stuff, he'll tell you that Race 2500 blend doesn't have quite as much lube as Byron's other fuels (it has 11 percent instead of 12 percent), but Byron claims the ratio of synthetic oil to castor oil that makes up that 11-percent total lubrication has been altered to 60/40 for additional lean-run protection.



SOURCE GUIDE

AIRTRONICS
(714) 978-1895;
airtronics.net

BYRON ORIGINALS
(712) 364-3165;
byronfuels.com

OFNA RACING
(949) 586-2910; ofna.com

THE COMPETITION

MODEL	DRIVE TRAIN	CHASSIS	ENGINE	STARTER	BALL BEARINGS	2-SPEED	RADIO	FAIL SAFE	PRICE*	REVIEWED
Associated Nitro TC3 RTR	Shaft	2.5mm	Associated .12	Pull	Rubber sealed	No	Ace Jaguar	No	\$310	1/03
DuraTrax Street Force	Belt	2.5mm	Velocity .15	Pull	Metal shielded	Yes	DuraTrax by Futaba	no	\$309	9/00
OFNA LD3 (single speed)	Shaft	2.5mm	Force .12	Pull	Rubber sealed	No	Airtronics Blazer	No	\$330	-
OFNA LD3 (2-speed)	Shaft	2.5mm	Force .12	Pull	Rubber sealed	Yes	Airtronics Blazer	Yes	\$250	6/03
Traxxas Nitro 4-TEC	Belt	2mm	TRX 2.5	Electric	Metal shielded	Yes	Traxxas TQ	No	\$340	6/03

*Varies with dealer



Team Losi Triple-XS Graphite Plus

FULL-ON FACTORY RIDE

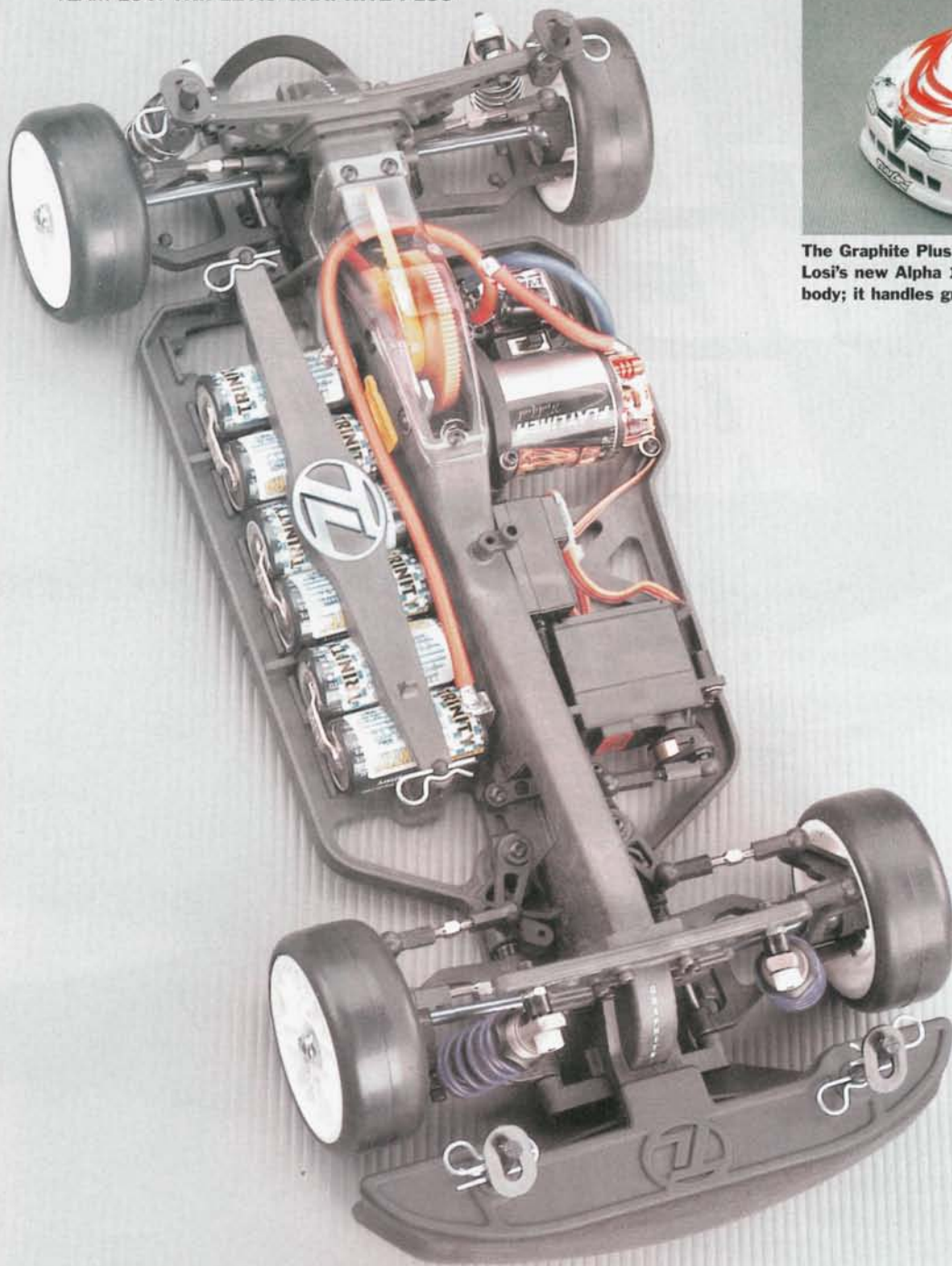


REMEMBER THE TEAM LOSI DOUBLE-X CR GRAPHITE PLUS?

It was the first Losi kit to include all of the available graphite-composite plastic parts and aluminum and titanium factory options in one box for a much lower price than the "regular" version of the kit with the options added separately. The "G-Plus" concept was an immediate hit, and Graphite Plus versions of Losi's race cars have been staples ever since. The latest to get the treatment is the Triple-XS, which gets every available graphite part (of course), as well as titanium turnbuckles, threaded-body shocks with titanium-nitride shafts, MIP CVD drive axles and more. Losi's new Alpha 156GTA body finishes off the package, and like all of the Graphite Plus machines that have preceded it, the Triple-XS G-Plus is much easier on your wallet than buying a standard Triple-XS and adding the Graphite Plus goodies later. Now let's take this factory ride for a spin.

track test

TEAM LOSI TRIPLE-XS GRAPHITE PLUS



The Graphite Plus includes Losi's new Alpha 156GTA body; it handles great.



DATA CENTER

VEHICLE TYPE 4WD on-road sedan

BEST BUYER On-road racing enthusiast

KIT RATINGS (poor, satisfactory, good, very good, excellent)

Instructions Excellent

Parts fit and finish Very good

Durability Very good

Overall performance Excellent

SPECIFICATIONS

MANUFACTURER Team Losi

MODEL Triple-XS Graphite Plus

DISTRIBUTED BY Horizon Hobby

SCALE 1/10

PRICE \$269 (varies with dealer)

DIMENSIONS

Wheelbase 10.13 in. (257mm)

Width (F/R) 7.44/7.47 in. (189/190mm)

WEIGHT

Total, as tested 51.84 oz. (1,470g)

CHASSIS

Type Molded semi-tub

Material Graphite-injected plastic composite

DRIVE TRAIN

Type Single-belt 4WD

Primary 18T pinion (not included)/90T spur gear

Transmission ratio 1.83:1

Final drive ratio 9.15:1

Drive shafts Aluminum MIP CVDs

Differential Sealed ball diffs

Bearing type Teflon-shielded ball bearings

SUSPENSION

Type Lower H-arms with titanium turnbuckles

Shocks Threaded, hard-anodized aluminum bodies with titanium-nitride shafts

WHEELS

Type 24mm mesh pattern

TIRES (F/R)

Type Losi pink-compound slicks

ELECTRONICS

Transmitter JR Racing XR2i

ESC GM Racing V3R

Steering servo JR Racing Torque

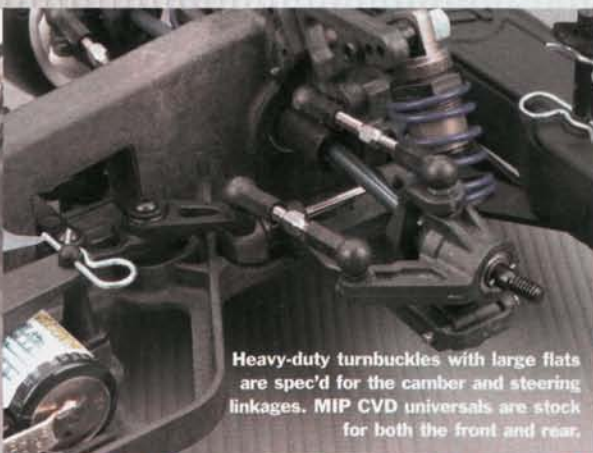
Race Z590M

Motor Speed 19

Battery Not included



Losi's hard-anodized shocks with titanium-nitride-coated shock shafts provide smooth and consistent damping.

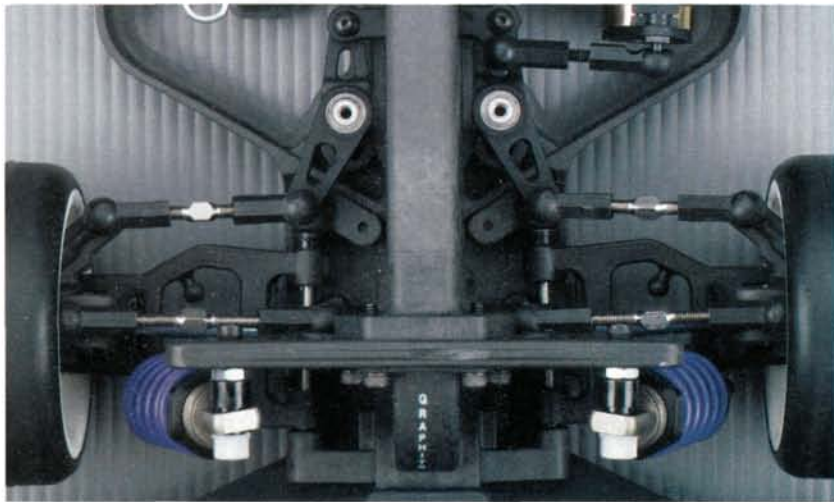


Heavy-duty turnbuckles with large flats are spec'd for the camber and steering linkages. MIP CVD universals are stock for both the front and rear.

...THE TRIPLE-XS CHASSIS DESIGN ISN'T PRONE TO TAKING A TWEAK ...

KIT FEATURES

CHASSIS. The Triple-XS G-Plus's chassis' overall layout is the same as that of the standard Triple-XS, but instead of "Stiffezel," this one is molded of a graphite-injected plastic composite for even greater strength and less weight. To further reduce weight, the chassis has been aggressively swiss-cheesed with holes and cutouts.



The shock towers are built extra wide and fit the molded-in bulkheads precisely. This makes the chassis virtually "tweak free" when under load or in a crash.

Seven battery slots along the right side of the chassis give racers the option to tailor the car's handling with battery placement, and the servo, receiver, motor and ESC are mounted on the left side. A molded tunnel for the single drive belt separates the chassis halves, and it protects the belt from dirt, carpet fuzz and other debris. A benefit of the Triple-XS G-Plus chassis design is that its one-piece chassis isn't prone to taking a tweak in a wreck (unlike a car that uses an upper deck for structural rigidity).

DRIVE TRAIN. The completely sealed drive train is effective in its simplicity. A new, low-friction yellow drive belt is wrapped around the front and rear diffs and is drawn up to the spur gear by a guide pulley. Team Losi gives racers three ways to build their diffs for the Graphite Plus. Included with the kit are two standard 42-tooth diff pulleys and a smaller 41-tooth pulley. Using the smaller pulley up front will over-drive the front wheels, and installing the smaller pulley in the back

will under-drive the front wheels. And instead of running the car with a front diff, you now have an option to build it with a front "spool." The spool locks down the front diff, so the front wheels are constantly driven—no diff action. This can definitely be advantageous on high-grip surfaces. A spool gives the car less off-power steering while giving it more on-power steering and forward drive—similar to a one-way. But unlike a one-way setup, a spool still provides 4-wheel braking.

The diffs can easily be adjusted without any disassembly. To change the diff settings, simply insert an Allen wrench into the outdrive, and turn the opposite wheel. Aluminum MIP CVDs are included for all four corners, and the entire drive train spins on high-quality ball bearings.

SUSPENSION AND STEERING. Like the chassis, the Graphite Plus's suspension arms are also made of the graphite-injected composite, and they can be moved forward or backward to alter the wheelbase. In the rear, an all-new graphite shock tower is bolted to the chassis, and new A-arms, low roll-center blocks and hub carriers further update the rear suspension.

The front of the car is relatively unchanged, although a new high-roll-center block helps the car drive flatter through the turns on high-bite tracks. Losi's proven hard-anodized shocks are standard equipment, and they're threaded for precise preload adjustments to the purple front and silver rear springs. Titanium-nitride-coated shock shafts reduce "stiction" when the shock shaft passes through the shock cartridge, and the numerous camber and shock-mounting locations give racers many tuning options. Droop adjustments are made through the bottom of the chassis. Unlike most cars that have droop screws in the A-arms, the G-Plus's droop screws are threaded up through the front and rear bumpers. By not having the screws in the arms, this setup slightly reduces the unsprung weight. Ball-bearing-supported bellcranks steer it in the right direction, and titanium turnbuckles are used throughout for increased strength.

BODY, WHEELS AND TIRES. Team Losi's pink-compound slick tires are wrapped around all-new 24mm mesh rims. Molded, low-profile foam strip inserts are included to support the soft-compound tires. To top it all off, an Alpha 156GTA body provides plenty of downforce in the front and rear, and it looks stylish.

BUILDING & SETUP TIPS

Team Losi's manuals have always been among the best in the industry, but here are a few things to be careful of during assembly.

- 1. PRE-THREAD THE SCREW HOLES.** A "gold" screw is in the bag with the wrenches. Use this to pre-thread all the screw holes in the chassis; it will make later assembly steps much easier.
- 2. BALL-CUP ASSEMBLY.** This tip comes straight from Todd Hodge. I noticed ball-cup binding when I first built the car. Todd suggested that I grab the ball cups from above with a pair of pliers, give them a squeeze, and rock them back and forth on the ball stud. I was skeptical, but it did the trick.
- 3. STEP B-6.** When you install the top shaft, don't overtighten the two screws that secure it. If you torque the screws down, you might bind the bearings against the inside of the tunnel.
- 4. STEP B-7.** When you install the belt-tensioner arm, pull it upward to keep it engaged on the tensioner bushing. If you don't, the tensioner pulley won't be able to swing up far enough to properly tighten the belt against the spur gear/pulley.
- 5. STEP E-11.** There is funky piece of clear plastic that you'll install on the battery side of the chassis. Since there is graphite in the chassis, and graphite conducts electricity, this plastic will help prevent your battery from being shorted out by the chassis.
- 6. STEP F-2.** Shock shafts and shock bodies in two lengths are included with the kit. Don't mix them up, or you'll have to rebuild the shocks.

YOU'LL NEED

- Transmitter and receiver
- Steering servo
- 6-cell battery pack
- Electronic speed control (ESC)
- Motor
- Pinion
- Charger
- Tire glue
- Polycarbonate-compatible paint

FACTORY OPTIONS

- Front one-way—Item no. LOSA3245
- 128T/64P spur gear with drive pulley—LOSA3954
- Hard-coated aluminum suspension balls—A-9940
- Springs: 30 lb. (white)/35 lb. (orange)/40 lb. (yellow)—LOSA5112/LOSA5114/LOSA5115
- Front swaybar set—LOSA4250
- 1-degree rear hub carriers—LOSA9853

PERFORMANCE

I tested the Triple-XS G-Plus at S&N's Traxxas Hobbies and Raceway's world-class carpet track that's just outside Milwaukee, WI. Home to the U.S. Touring Car Championships, the NORRCA On-Road Carpet Nats, the ROAR Oval Nats and Team Losi driver Paul Lemieux, the competition there is always extremely tough. It was a perfect test track for the G-Plus.

None of the drivers were racing in modified on the night that I was there, so for competition, I substituted a Trinity Monster Stock motor in place of the Flatliner. I also exchanged the kit's pink-compound slicks for Take Off CS-27 spec tires (the handout tire from the U.S. Touring Car Champs). With the Trinity battery charged and the tires sauced, it was time to hit the track!

I took it easy for the first lap or two to make sure that all the trims had been set properly, but I opened up the throttle at the beginning of the long back straight and quickly found myself down the backstretch and into the first turn. The G-Plus accelerated quietly and effortlessly—proof of how efficient Losi's single-belt design truly is. Through the infield, the car exhibited a low-speed push that required a light throttle finger to avoid overshooting the next turn. It excelled in the high-speed sections of the track; a chicane after the backstretch gave me the opportunity to make up ground on almost every lap.

After I had drained the first pack, I headed to the pits to try to get rid of the push. The Triple-XS design is extremely user-friendly. In only a few minutes, I was able to change the battery's placement, alter shock position, adjust the diff settings and more. I even managed to swap the front diff for a front

THE G-PLUS ACCELERATED QUIETLY AND EFFORTLESSLY—PROOF OF HOW EFFICIENT LOSI'S SINGLE-BELT DESIGN TRULY IS.

LIKES

- Ready to race right out of the box.
- Titanium and graphite used throughout.
- Durable.
- Easy to wrench on.

one-way and install a front swaybar within minutes.

Team Losi's Todd Hodge and Paul Lemieux gave me pointers on how to set up the G-Plus for my track, and the car responded to my changes as expected. What impressed me most about the Triple-XS was how it shook off a meeting with the boards and then continued as if nothing had happened. It never took a tweak—no matter how hard the hit.

THE VERDICT

I now know one of the reasons why Paul Lemieux is so fast every week. OK; so he's extremely talented, but he also has one heck of a car under him! It's the same car as anyone can now own—the Triple-XS Graphite Plus. This ride is extremely user-friendly and durable, and its responses to chassis changes and driver input are exactly as expected.

The Graphite Plus is still a very complete, top-of-the line kit; swaybars and a front one-way are just about the only options not in the box. I look forward to more track time with this car and to tuning and refining it so I can use its maximum potential. The Losi Triple-XS Graphite Plus is such an easy-to-drive car that it helps to compensate for less than perfect driving and setup skills.



Trinity Sanyo 3300 batteries 10x1 Flatliner and Monster Stock motors

The Sanyo batteries and Flatliner motor combo is the same as was used during the recent U.S. Touring Car Championships by most of the Trinity/Losi camp. The Flatliner motor ensures a ton of infield punch and still has great power on the top end. Unfortunately, no one ran modified on the night that I tested the Triple-XS G-Plus, so I swapped the Flatliner for a Monster Stock. The Sanyo 3300 cells are the latest in NiMH technology, and Trinity ensures maximum performance with its VIS matching process. All in all, this is a lethal combination against the competition.

Additional items used to complete the Triple-XS Graphite Plus:

JR Racing R1 transmitter with R200 FM receiver

JR Racing Z8450 ultra-speed digital servo

GM Racing SX9 ESC

Take Off CS-27 spec tires

DISLIKES

- Swaybars and one-way aren't included.
- Some binding in the suspension (ball cups).

SOURCE GUIDE

GM RACING distributed by Horizon Hobby Inc.; gm-racing.com.

HORIZON HOBBY INC. (217) 355-9511; horizonhobby.com.

JR RACING distributed by Horizon Hobby Inc.

TAKE OFF distributed by Schumacher USA (813) 889-9691; racing-cars.com; powers-international.com.

TEAM LOSI distributed by Horizon Hobby Inc.; teamlosi.com.

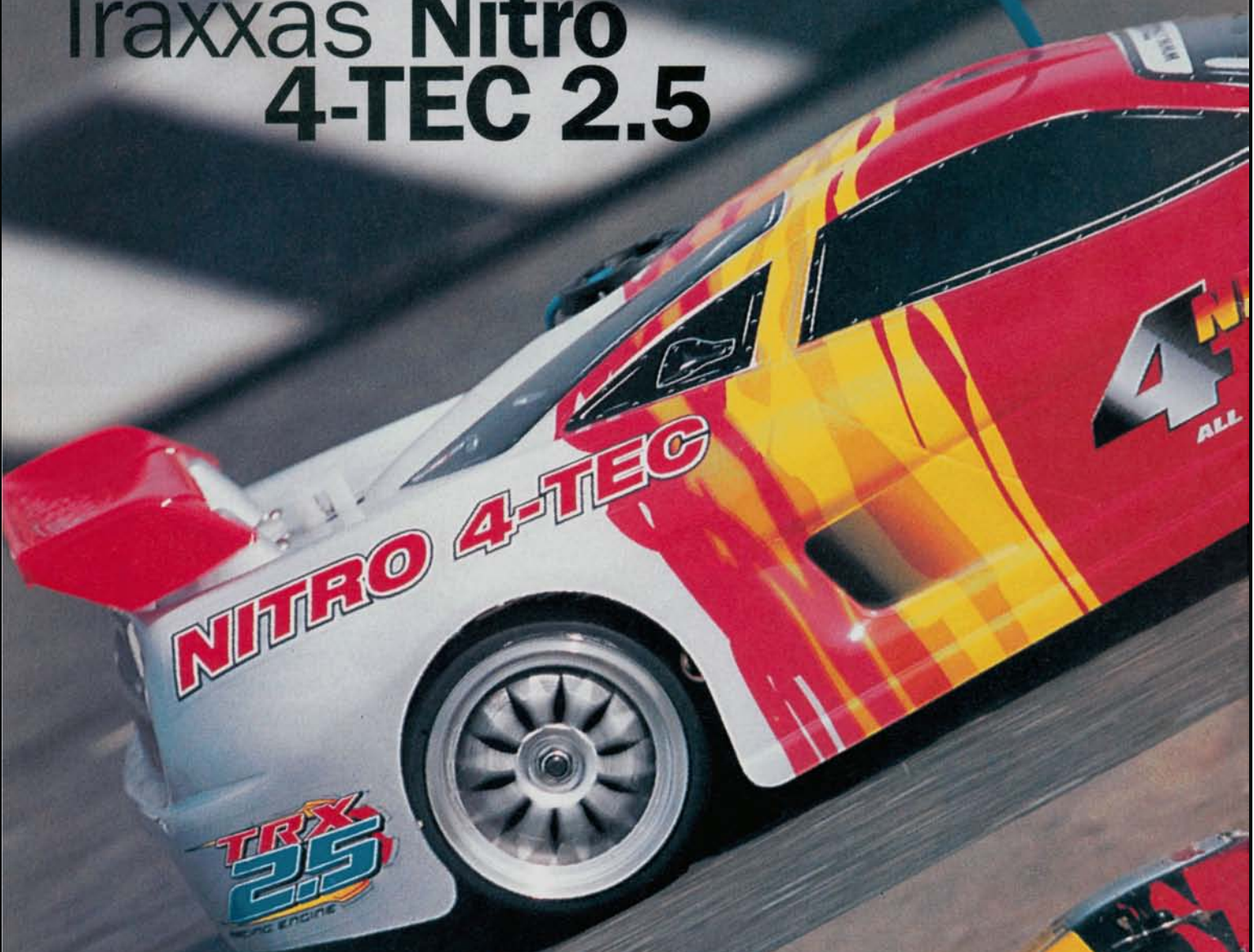
TRINITY PRODUCTS INC. (732) 635-1600; teamtrinity.com.

THE COMPETITION

MODEL	CHASSIS	DRIVE TRAIN	SHOCKS	DIFFERENTIALS	AXLES	TIRES	BODY	PRICE***	REVIEWED
Associated Factory Team TC3	Molded semi-tub	Shaft	Aluminum threaded-body	Ball	MIP CVD	Not included	Not included	\$300	12/01
MRC Academy STR-4 Pro	Graphite plate	Shaft	Aluminum threaded-body	Ball	Universal	Belted slick	Not included	\$220	12/01
SpeedMind Daytona RS	Carbon graphite	Dual-belt	Aluminum threaded-body	One-way/ball	MIP CVD	Not included	Not included	\$350	10/02
Tamiya TRF414MkII	Graphite plate	Dual-belt	Aluminum threaded-body	One-way/ball	CV-type	Not included	Not included	\$419	9/02
Team Losi Triple-XS GP	Graphite semi-tub	Single-belt	Aluminum threaded-body	Ball	MIP CVD	Belted slick	Alpha 156GTA	\$269	6/03
XRAY T1	Graphite plate	Dual-belt	Plastic threaded-body	Ball	Universal	Belted slick	Not included	\$325	12/01

Prices vary with dealer

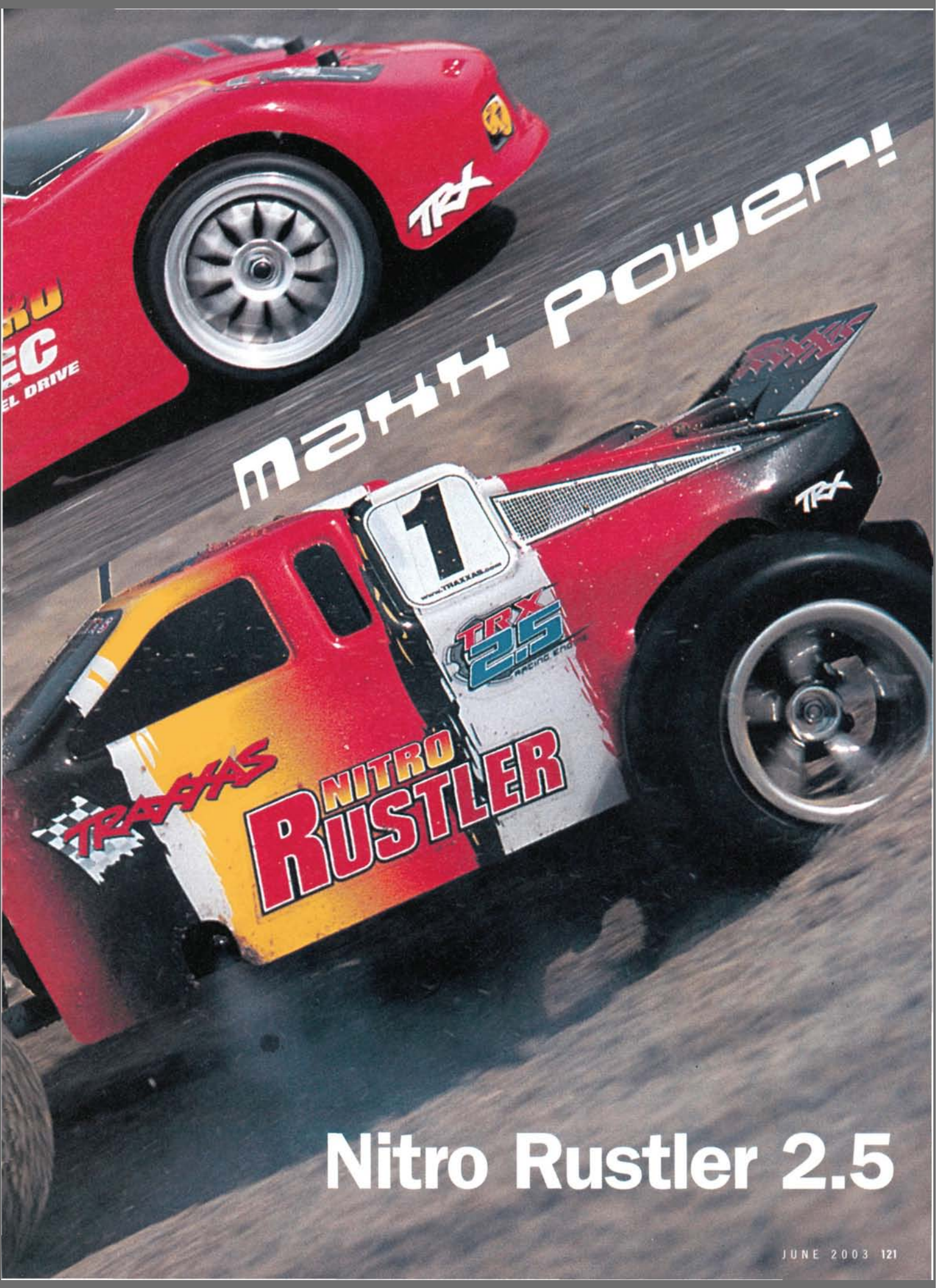
Traxxas Nitro 4-TEC 2.5



TRAXXAS IS THE COMPANY THAT MADE RTR A WELL-KNOWN ABBREVIATION.

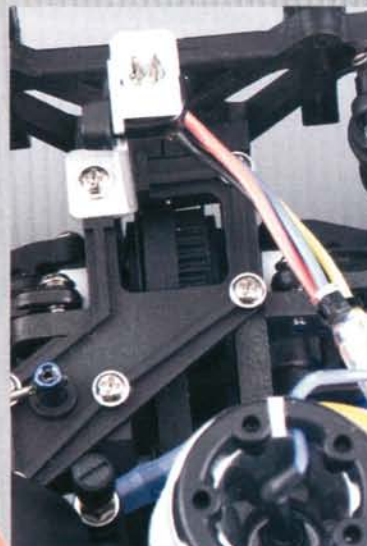
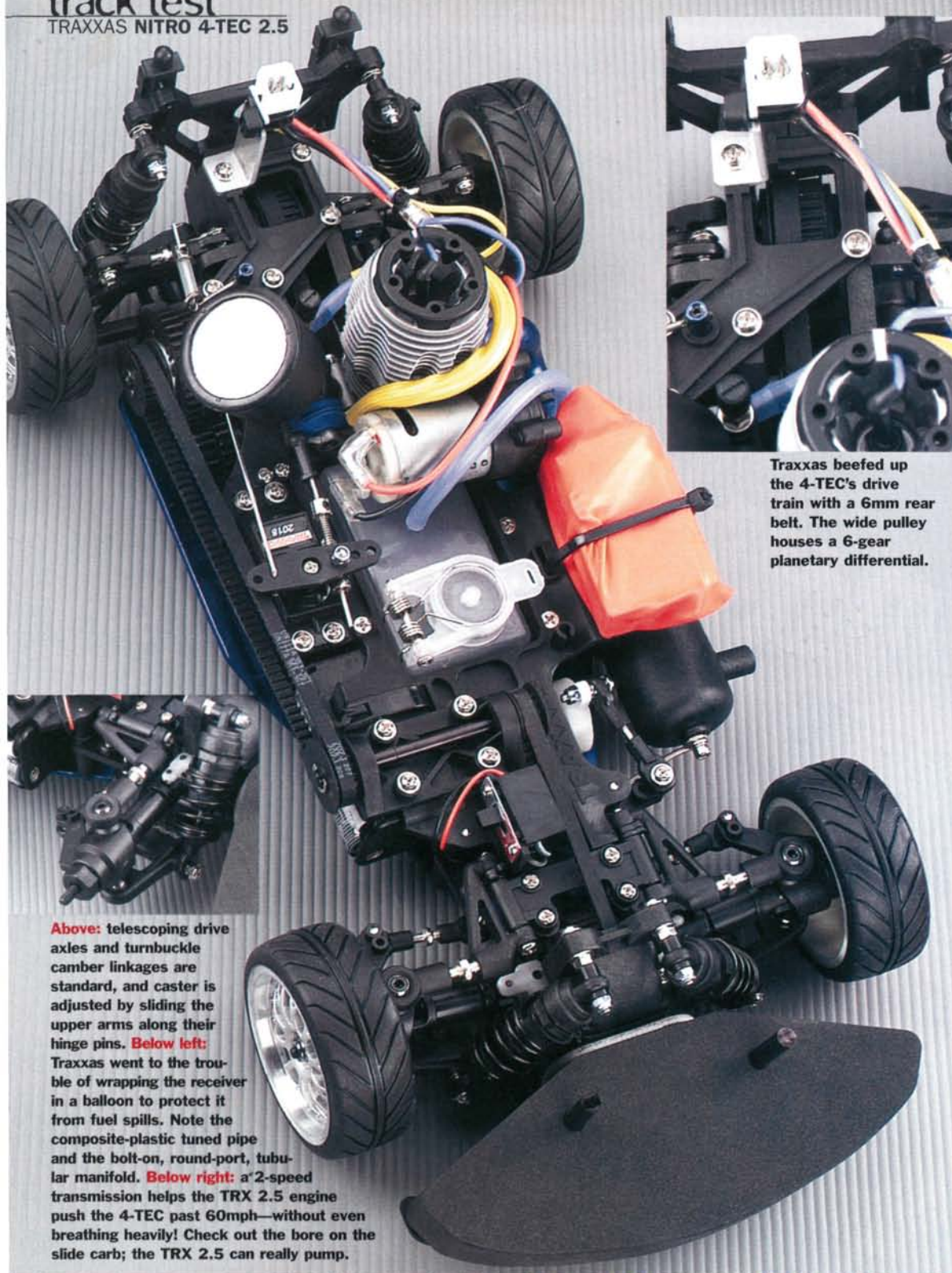
There were RTR cars before there was Traxxas, but it was that company who took the ball and ran with it to the point at which RTR and Traxxas became synonymous.

Before the very popular T-Maxx captured the limelight as the flagship RTR of the Traxxas fleet, the two currently available vehicles that were most responsible for cementing the association between Traxxas and RTRs are the Nitro 4-TEC and the Nitro Rustler. These vehicles have been around for roughly five years, and they offer an excellent blend of performance, reliability and durability and are backed with customer support. We're taking a second look at both of these vehicles because in addition to various upgrades, they are powered by the new TRX 2.5 engine, which totally shatters the expectations of RTR engines and, to put it mildly, sets new standards of power and performance in RTR vehicles. Both vehicles were already favorites among RTR enthusiasts; the addition of the new TRX 2.5 engine kicks it up about 20 notches because it gives them the power and performance that was once reserved for racing vehicles with pure-bred racing engines.



max power!

Nitro Rustler 2.5



Traxxas beefed up the 4-TEC's drive train with a 6mm rear belt. The wide pulley houses a 6-gear planetary differential.

Above: telescoping drive axles and turnbuckle camber linkages are standard, and caster is adjusted by sliding the upper arms along their hinge pins. **Below left:** Traxxas went to the trouble of wrapping the receiver in a balloon to protect it from fuel spills. Note the composite-plastic tuned pipe and the bolt-on, round-port, tubular manifold. **Below right:** a 2-speed transmission helps the TRX 2.5 engine push the 4-TEC past 60mph—without even breathing heavily! Check out the bore on the slide carb; the TRX 2.5 can really pump.



DATA CENTER

VEHICLE TYPE .15-powered 4WD touring car

BEST BUYER Any nitro RTR enthusiast

KIT RATINGS (poor, satisfactory, good, very good, excellent)
Instructions Excellent
Parts fit and finish Good
Durability Very good
Overall performance Very good

SPECIFICATIONS

MANUFACTURER Traxxas
MODEL Nitro 4-TEC 2.5
SCALE 1/10
PRICE 339.99
Varies with dealer

DIMENSIONS

Wheelbase 10.16 in. (258mm)
Width 7.8 in. (198mm)

WEIGHT

Total, as tested 65.8 oz. (1,865g)

CHASSIS

Type Stamped lower plate with molded upper deck
Material (lower/upper) 2mm-thick, blue-anodized aluminum/molded plastic

DRIVE TRAIN

Type Triple-belt
Primary 16T/20T clutch bell/41T/37T spur gears
Drive-train ratio 2.67:1
Final drive ratio 6.83:1 (1st gear)/4.93:1 (2nd gear)
Drive shafts Telescoping universal joint
Differential 6-gear, planetary-type
Bearing type Rubber-sealed ball bearings

SUSPENSION

Type (F/R) Double A-arms with adjustable upper arms/lower H-arms with turnbuckle upper links
Shocks Molded plastic-body with bladder seal

WHEELS

Type Chrome-plated, one-piece plastic

TIRES

Type Medium-compound street tread with contoured foam inserts

ENGINE AND ACCESSORIES

Engine Traxxas TRX 2.5 with EZ-Start 2 electric-start system
Carburetor 2-needle slide valve
Exhaust Molded tuned pipe with aluminum rear-exhaust header
Fuel tank 75cc, primer-less

TRAXXAS NITRO 4-TEC 2.5

The original Nitro 4-TEC received a lot of attention because it was the first RTR to break the 50mph barrier. This happened when most nitro touring cars cruised along at a leisurely 20 to 30mph; they were geared more for all-around driving than for blistering top speeds. Traxxas only had to listen to enough people ask "How fast does it go?" before it tweaked the Nitro 4-TEC to answer that question with a resounding "50mph!"

RETURNING 4-TEC FEATURES:

- Double A-arm front suspension with turnbuckle camber adjustment.
- Lower H-arm rear suspension with turnbuckle adjustable upper links.
- Double-deck chassis with aluminum lower plate and molded upper deck.
- 3-belt drive system.
- Adjustable cam-type 2-speed transmission.
- 6-gear, planetary-type steel-gear differentials front and rear.
- Disc-brake 4-wheel braking.
- Telescoping universal-joint drive shafts.
- Foam front bumper.
- Traxxas 2-channel Top Qualifier radio.
- Oil-damped and molded shocks.
- Prepainted and trimmed body.
- Die-cut decals.

NEW 4-TEC 2.5 FEATURES:

- Stiffer suspension-arm material.
- Revised 2-speed-shift clutch calibration and a stronger locking mechanism that handles the higher-revving, more powerful TRX 2.5 engine.
- 6mm-wide rear drive belt that handles more power.
- Stronger crosspin-style outdrive yokes.
- Mounted and glued tires with contoured inserts.
- Revised throttle linkage and servo mounting to accommodate a slide carburetor.
- Revised engine mount to suit the new engine.
- Improved EZ-Start 2 electric starting system.

Traxxas has converted the concept of onboard starting from an

inside the EZ-Start 2

obscure aftermarket option to a desirable standard feature that is now included with every Traxxas nitro-powered RTR. First seen attached to the Pro .15 engine, the EZ-Start system has changed the manner in which RTR enthusiasts start their engines, and many other manufacturers have followed suit. With the change to the new, more powerful TRX 2.5 engine, Traxxas has upgraded its starter to make it more user-friendly and durable.

The new EZ-Start 2 electric starting system includes the following features, and they make it even easier to use and more reliable than ever.

- > "Smart Start" technology that monitors the condition of the glow plug and how much power it receives ensures reliable starting. It also monitors the starter motor for a bad circuit and prevents it from being overloaded.
- > New, smaller, lighter planetary gear drive reduces onboard weight.
- > Elastomer "cush drive" cushions the starter-assembly gear drive and protects the gears from damage.
- > A new roller clutch bearing ensures a positive and more reliable engagement of the onboard starter.
- > A self-contained EZ-Start 2 controller allows one-handed operation and leaves your other hand free to operate the radio and make adjustments.

All bets are off with this new 2.5-powered version of the 4-TEC, which runs an engine that has roughly double the horsepower of the previous engine. Of course, that doesn't mean double the speed, but it transforms the 4-TEC from being a car that had to work to reach 50mph into one that yawns at running faster than a mile a minute.

Along with the best of the 4-TEC's "old" features, there's a lot of new stuff in the TRX 2.5-equipped car.

PERFORMANCE

Like the new Rustler, the 4-TEC benefits from the TRX's easy starting and tuning and from the big boost in power. The 4-TEC 2.5 isn't as animated as the Rustler is with respect to pulling long, effortless wheelies, but it's more potent in terms of acceleration because it's lighter and is a 4WD. The 4-TEC features a 2-speed transmission, so when it starts to run out of legs in first gear, it clicks into second for a little extra burst of speed, and that makes it the faster of the two.

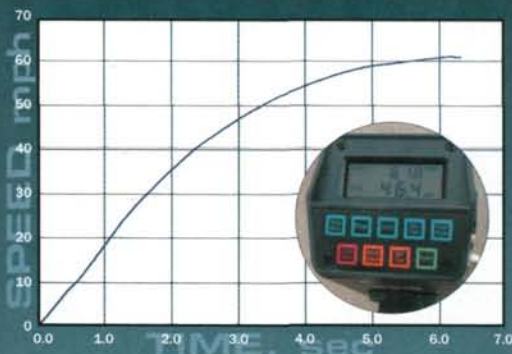
Acceleration from a standstill can cause considerable wheelspin, especially if there's dust or light sand on the parking lot or road. New, harder-compound tires are included with the 4-TEC; these last longer than softer tires, but they just don't stick as well. The nice thing about the new tires is that they "drift" very nicely (a 4W-sideways slide). Properly regulated doses of throttle and steering input can result in a long, sweeping drift through a long sweeper. Softer tires would certainly improve cornering for anyone who wants to get through the twisties more quickly, but they will take some of the fun out of it.

The 4-TEC's handling is on the aggressive side. There's a noticeable oversteer, and that is no doubt amplified by the hard-compound tires. This means that the rear of the car wiggles around when it's cornering. But these handling characteristics are what make the 4-TEC so much fun to drive in average parking-lot conditions. When you get behind the wheel of the 4-TEC, there's something about the way it drives that erases any concern for taking the apex of a corner properly or for on-power steering. Instead, high-speed passes, long, drifting corners and 4W burnouts (without the smoke) become the objectives.

Speed is the name of the game with the new Nitro 4-TEC. Right up there with "How much does it cost?," one of the most frequently asked questions about it is "How fast does it go?" The addition of the new TRX 2.5 engine means that this car should be able to breach the speed limit in most states.

Acceleration testing showed that the 4-TEC's engine has more power than the tires have traction. Light dust and debris on the road robbed enough traction to make it a challenge to keep the car pointing straight ahead. Sticky tires and a cleaner road would probably allow full-punch, straight acceleration, but even when I was prepared for it, I was surprised by how the 4-TEC ripped away from the line with power to spare—thanks to its TRX 2.5 engine. Even with full 4WD, I don't think the 4-TEC stopped spinning its tires until it was about halfway through its rpm range.

Given the TRX 2.5's huge increase in power over the Pro .15, it's certain that it will push the 4-TEC to even higher speeds, but "How fast?" is the question. Without much fine-tuning (which indicates that anyone with an ear to tune an engine can pull this off), after just a few passes, the 4-TEC blazed past the radar gun at 61.8mph. At that speed, the car travels at about 90 feet per second, so it eats up real estate quickly. I'm very confident that this car has a few more mph in it; it just needs more precise engine tuning and a little more running room.



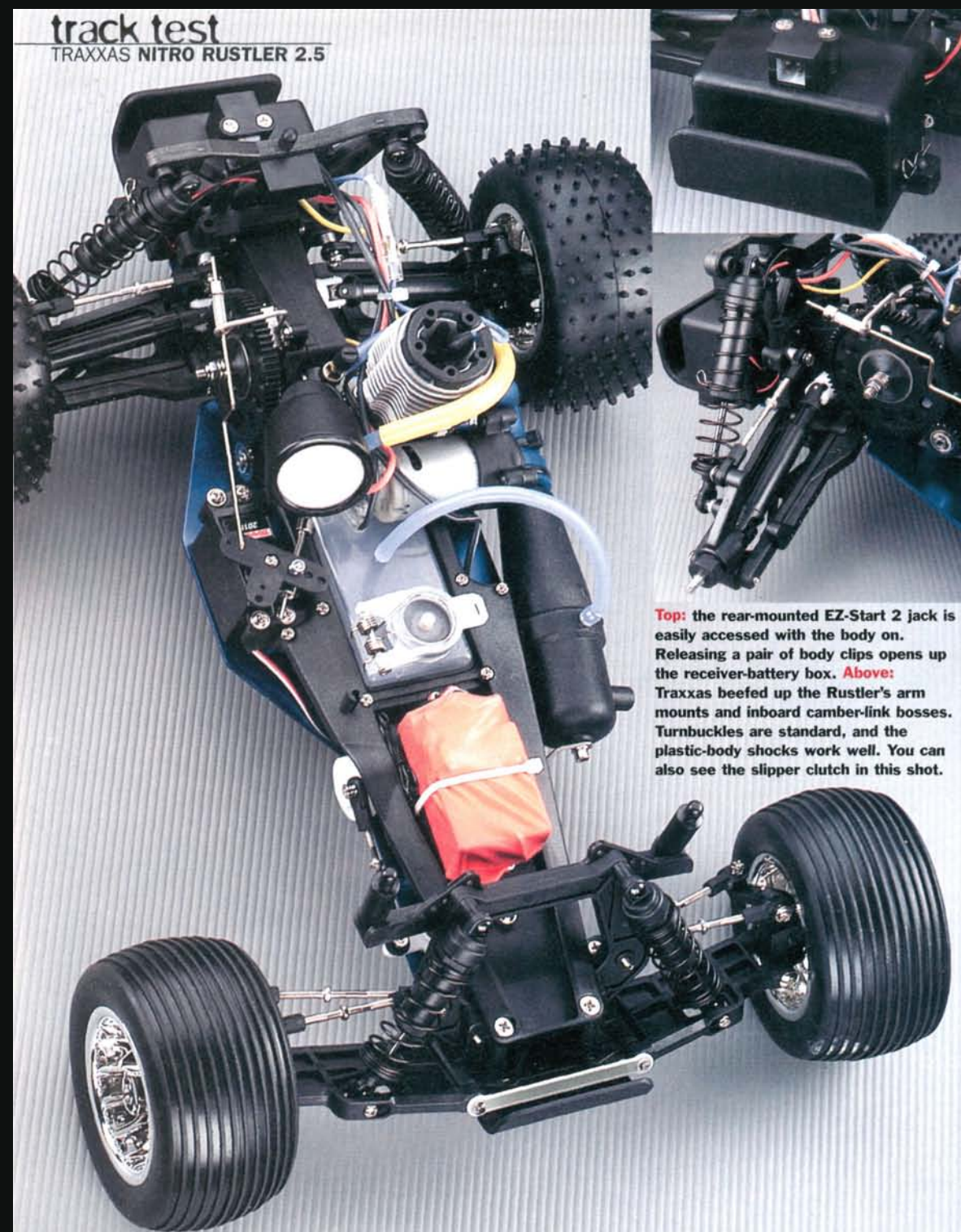
Traxxas TRX 2.5 engine

Unless you haven't been paying attention to what's happening in the RC world, or you're brand-new to RC, you've probably heard about Traxxas' new small-block TRX 2.5 engine. It was introduced as the standard powerplant for the revised version of the T-Maxx, which was released late last year.

Rarely is such attention given to an RTR's new engine, but this isn't your ordinary RTR engine. Compared with the engine it has replaced, the TRX 2.5 puts out roughly double the horsepower. It has basically redefined the RTR engine category, and it even challenges the establishment with respect to raw power output. It's among the most powerful small-blocks available.

TRX 2.5 FEATURES

- > ABC construction with precision-honed, hard-chrome piston-sleeve plating.
- > "Square" bore and a stroke/engine geometry that has been optimized for an engine of its size.
- > High-silicon aluminum piston for longer life.
- > Offset wristpin and a long, knife-edged connecting rod to maximize the power stroke.
- > Molded liquid-crystal-polymer (LCP) slide carburetor with two air/fuel mixture needles.
- > O-ring-sealed rear exhaust port.
- > Exhaust header secured with screws instead of springs.
- > Precise integrated-pilot-shaft (IPS) crank design that minimizes clutch vibration.
- > Air filter designed to work more efficiently with carburetor.



Top: the rear-mounted EZ-Start 2 jack is easily accessed with the body on. Releasing a pair of body clips opens up the receiver-battery box. **Above:** Traxxas beefed up the Rustler's arm mounts and inboard camber-link bosses. Turnbuckles are standard, and the plastic-body shocks work well. You can also see the slipper clutch in this shot.

DATA CENTER

VEHICLE TYPE .15-powered, 2WD RTR stadium truck

BEST BUYER Any nitro enthusiast

KIT RATINGS (poor, satisfactory, good, very good, excellent)

Instructions Excellent

Parts fit and finish Good

Durability Very good

Overall performance Very good

SPECIFICATIONS

MANUFACTURER Traxxas

MODEL Nitro Rustler 2.5

SCALE 1/10

PRICE 319.99

Varies with dealer

DIMENSIONS

Wheelbase 11.38 in. (289mm)

Width 12.24 in. (311mm)

WEIGHT

Total, as tested 73.4 oz. (2,082g)

CHASSIS

Type Stamped lower plate with molded upper deck

Material (lower/upper) 2mm-thick, blue-anodized-aluminum/molded plastic

DRIVE TRAIN

Type Enclosed gearbox

Primary 20T clutch bell/70T spur gear

Transmission ratio 2.81:1

Final drive ratio 9.84:1

Drive shafts Telescoping universal joint

Differentials 6-gear, planetary-type

Bearing type Rubber-sealed ball bearings

SUSPENSION

Type (F/R) Molded H-arms/turnbuckle-type camber links

Shocks Molded plastic-body with bladder seal

WHEELS

Type Chrome-plated, one-piece plastic

TIRES

Type (F/R) Soft-compound ribbed/medium pin-spike with firm foam inserts

ENGINE AND ACCESSORIES

Engine Traxxas TRX 2.5 with EZ-Start 2 electric-start system

Carburetor 2-needle slide valve

Exhaust Molded tuned pipe with aluminum rear-exhaust header

Fuel tank 75cc, primer-less

Above: a primer-less tank feeds the TRX 2.5 engine and is centrally mounted on the chassis so fuel consumption won't affect handling. **Right:** The Rustler gets the same exhaust package as the 4-TEC. The manifold doesn't have to go far to sneak around the EZ-Start 2's low-profile gearbox.



TRAXXAS NITRO RUSTLER 2.5

The Nitro Rustler 2.5 is a 2WD stadium-class truck. It features wide suspension for stability and enough ground clearance to clear most of the obstacles you'd encounter during the typical bashing session. Traxxas

RETURNING RUSTLER FEATURES:

- Double-deck chassis with blue-anodized-aluminum power plate and a molded upper deck.
- Lower H-arm suspension with turnbuckle adjustable upper links.
- 3-gear transmission with a rugged 6-gear, planetary-type, steel-gear differentials.
- Rear disc brake.
- Adjustable peg-type slipper clutch.
- Telescoping universal-joint rear drive shafts.
- Oil-damped and molded shocks.
- Prepainted and trimmed body.
- Die-cut decals.
- Traxxas 2-channel Top Qualifier radio with upgraded high-torque steering servo.

NEW RUSTLER 2.5 FEATURES:

- More durable heavy-duty rear suspension mounts.
- More durable heavy-duty rear camber-link mounts on the bulkhead.
- Full set of ball bearings (wheels previously had bushings).
- Stronger crosspin-style outdrive yokes.
- Revised transmission brace to clear the new TRX 2.5 engine.
- Revised throttle linkage and servo mounting to accommodate a slide carburetor.
- Revised engine mount to suit the new engine.
- Soft-compound tires with inserts improve traction.
- Improved EZ-Start 2 electric starting system.

INCLUDED electronics & accessories

TRAXXAS TQ-3 2-CHANNEL RADIO

Traxxas uses the TQ-3 in all of its RTR vehicles. It features throttle- and steering-trim knobs as well as servo-reversing for both channels. There is also a neutral positioning switch that sets the throttle/brake trigger for 50:50 (50 percent of the throw is for throttle and 50 percent for brake) or for 70:30.

EZ-START 2 ELECTRIC STARTING SYSTEM

The EZ-Start 2 onboard electric starting system has been revised for the new TRX 2.5 engine (see "Inside the EZ-Start 2"). It features a self-contained controller that allows one-handed operation, and it has been beefed up to handle the new engine better and to improve reliability.

VARIOUS TOOLS

A number of tools are in the box with each of the vehicles: Allen wrenches, an X-wrench (similar to the famous "Tamiya tool") and a Z-shape wheel wrench. Basically everything you'll need for most maintenance chores on the vehicles—except for standard tools—is in the box.

understands that this truck will have to take harder lumps than the average stadium truck, so it's built to withstand a little more abuse than purpose-built racers. Here's the breakdown on the "classic" Rustler features and the new additions to the TRX 2.5-equipped version.

PERFORMANCE

Kudos to Traxxas for including one of the easiest to start and most well-behaved engines with the Rustler. Firing up the TRX 2.5 with the included EZ-Start 2 onboard starting system is as simple as it gets. Just install a 6-cell battery pack in the controller, plug it into the truck, and push the button. Plugging the exhaust for about five seconds while holding down the starter button helps to pump fuel to the engine more quickly for easier starting.

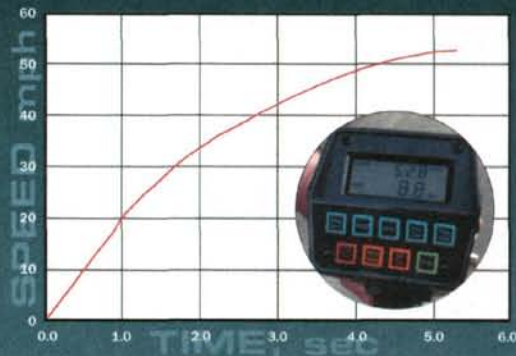
The factory needle settings are in the right range: from the very first start, the engine fired up and ran just beautifully. To optimize performance, only subtle tweaks to the main needle will be needed (depending on weather conditions).

It would be a huge understatement to say that the TRX 2.5 engine boosts performance. Even when it's running on sand or loose dirt, a quick stab of the throttle easily pulls the truck's front wheels off the ground; it will even flip backward if you hold the throttle too long. The power isn't limited to bottom end. The TRX 2.5 can rev up to ear-shattering rpm on the top end, which produces very impressive speeds, but the truck is a handful at this end of the speed range. On asphalt (where we test vehicles for top speed), the Rustler will pull wheelies on command when the engine has been tuned properly. The softer-compound spiked rear tires don't last long on the asphalt, but that's the tradeoff for better traction in the dirt.

The Nitro Rustler 2.5 is capable of tremendous speed. Radar tests confirm that it can eclipse 50mph with the standard clutch bell, but when doing that, it was cranking at what sounded like rod-snapping rpm (it certainly would have snapped a rod in a lesser engine). This engine endured a number of high-speed passes without any signs of trouble, but it isn't very healthy to repeatedly make high-rpm runs with gearing that is intended for all-around performance. Bumping up two teeth to a 22-tooth clutch bell partway through the testing helped bring lower engine rpm down to a more reasonable level, and it also kicked up the top speed to a smokin' 52.8mph.

A few words of caution: when you make high-speed passes with the Nitro Rustler 2.5, its handling is a little touchy when the speed exceeds 40mph. When you accelerate very strongly, as long as the front end doesn't rise too much, you can hold the throttle pegged until you get in the 40mph-plus zone. Above these speeds, steering becomes increasingly sensitive, and making even minor corrections can be a little hairy. On more than a few occasions, I sent the Nitro Rustler into a 50mph-plus barrel roll while trying to obtain maximum speed. To its credit, the sturdily built Rustler didn't break, but it's a good idea not to test that too frequently.

Simply knowing that this truck is capable of such speed should be like a nuclear deterrent: no one will want to call your bluff unless they're prepared for the consequences, and you don't want to use it unless you have to. In the case of the Nitro Rustler 2.5, the consequence of challenging it to a speed contest will usually be that the other vehicle will have its doors blown off.



SHOCK-SPRING PRELOAD CLIPS, ETC.

Preload clips (spacers for the shocks) are included, as are extra body clips. The extra preload clips are helpful if you want to fine-tune the suspension, but I found the stock setup appropriate for most purposes. I like the extra body clips and would gladly trade all the preload clips for more body clips because I lose them as fast as I can replace them.

FULL-COLOR INSTRUCTION MANUAL AND ENGINE-TUNING DVD

The instructions for the Nitro Rustler 2.5 and the Nitro 4-TEC 2.5 are excellent. The full-color manual includes a great deal of useful information. My only complaint is the absence of assembly instructions; even an exploded-view drawing of the vehicles would help those who want to do their own maintenance. But the instructions are first-class for getting your vehicle prepared to run, and there's solid tuning and engine break-in advice, too. With the well-made engine-tuning DVD and the additional support information that's on the Traxxas website (traxxas.com), you have the most comprehensive RC-vehicle support package available.

SOURCE GUIDE

TRAXXAS (888) 872-9972; traxxas.com.

OUTLAW RANGERS ENGINES

22 LARGER-THAN-LEGAL SMALL-BLOCKS



by Steve Pond



Most race-sanctioning organizations allow only .12 (2.1cc) small-block engines, but a range of other “larger-than-legal” small-block engines are far more popular with those who live to bash and thrash. These “Outlaw” engines (as they’re called) feature higher displacements than the “legal” engines, but they’re still in a small-block housing, so they’ll fit just about any vehicle that was designed for a .12.

Our sources in the States tell us that these larger-than-legal small-blocks now account for the vast majority of RC engine sales. For those of you who just don’t want to live by the rules, our guide will help you to navigate the ever growing field of .15 to .18 small-blocks.

Note: prices vary with dealer.

ASSOCIATED .15 PULL-START \$120

Bore	15mm
Stroke	14mm
Piston/sleeve	ABC
Pull-start	✓
Non pull-start	
Slide carb	
Rotary carb	✓
Standard crank	
Short crank	
Pilot crank	✓
Standard plug	✓
Turbo plug	
Transfer ports	3
Side exhaust	✓
Rear exhaust	



Comments. The Associated .15, originally developed for the RC10GT RTR, is a well-built sport engine that, among other features, has ABC construction; a true 90-degree side exhaust port and a knife-edged connecting rod. It has a short pilot shaft that avoids the potential for vibration that’s typical of bolt-on pilot-shaft applications.

DURATRAK TORQ .16 \$120

Bore	15.75mm
Stroke	13.9mm
Piston/sleeve	ABC
Pull-start	✓
Non pull-start	
Slide carb	
Rotary carb	✓
Standard crank	✓
Short crank	
Pilot crank	
Standard plug	✓
Turbo plug	
Transfer ports	3
Side exhaust	✓
Rear exhaust	



Comments. This is the standard engine in some of DuraTrak’s popular nitro vehicles. It features a pull-starter and a 2-needle rotary carb, which is the most popular configuration for small-block engines. This means that it can be installed in just about any car designed for a small-block.

Choose the right carburetor

Most engines are available in two versions: with either a slide or a rotary carburetor.

There are two factors to consider with respect to the type of carburetor you choose:

1. EASE OF INSTALLATION—PRIMARY FACTOR.

Some vehicles require a certain type of carburetor, but almost anyone who’s motivated will be able to make any engine with any style of carb fit his vehicle. But when you choose the type of carburetor recommended by the vehicle’s manufacturer, you’ll enjoy a more straightforward installation.

2. CARB PERFORMANCE—MUCH LESS IMPORTANT.

This topic is fodder for quite a few urban legends, among which are: you have to use slide carbs for on-road and rotary carbs for off-road; engines with slide carbs have much more power—myths! Yes, there are some subtle differences between the ways an engine will perform with either type of carb, but it isn’t as if you’ll say, “Whoa!! My car is so much faster now that I’ve switched to ‘X’ type of carburetor.”

> **SLIDE CARB:** features a more linear throttle response and breathes a little better on the top end for an increase in rpm.

> **ROTARY CARB:** produces a slightly softer throttle response because of the way in which air and fuel flow through it when it’s partially open. Its needle assembly also restricts the airflow very slightly, and that can knock a little off the top of an engine’s rpm range.

The idea that rotary carbs are best for off-road applications arose simply because a number of $\frac{1}{10}$ off-road vehicles were designed for engines with rotary carbs. Now, with an influx of small-block engines that are available with slide carbs, that notion is gradually being abandoned. Yes, a carburetor’s construction can have a subtle impact on an engine’s performance, but most of us would hardly notice the differences between the two types.

TRX 2.5: reinventing the "big" small-block



Ever since someone got the idea to squeeze a little extra displacement out of a .12 small-block engine, .15 engines and larger have become the top choice. But most .15 engines still closely resemble their smaller siblings, and while they may have a larger piston, the rest of their components—the engine block, the crankshaft, the connecting rod and carburetor, among others—are shared with the .12 version.

Traxxas recently designed a new small-block .15 engine from the ground up without using any components from existing engines; it's the TRX 2.5. By starting from scratch, Traxxas was free of previous design restraints and was able to optimize the TRX 2.5's design.

What makes the TRX 2.5 engine special? Basically, the ingredients that make any good engine special—a combination of proper design, high-quality materials and precision machining. Its interior geometry and other various specifications have been optimized for this engine and this engine alone, so there's no compromise in performance. Traxxas also chose the time-tested combination of a high-silicon aluminum piston, a brass sleeve and a chrome-plated bore (ABC). This piston/sleeve combination delivers the best performance and the longest engine life. Tying all this together is precision machining. The precision with which all the engine's parts are made and how they fit together is what really makes the difference between a good engine and a great engine. Traxxas invested in the latest production technology to ensure that the TRX 2.5's machining is accurate and consistent.

Simply put, the TRX 2.5 represents a new standard for RTR small-block engines. It's the most powerful small-block to be included in an RTR, and its performance rivals those of some pretty powerful aftermarket engines. Its power catapults all the vehicles in which it's installed to levels of performance that may take other RTRs a long time to match.

DURATRAK VELOCITY .17 \$120

Bore	16.6mm
Stroke	13.5mm
Piston/sleeve	ABC
Pull-start	✓
Non pull-start	
Slide carb	
Rotary carb	✓
Standard crank	
Short crank	✓
Pilot crank	
Standard plug	✓
Turbo plug	
Transfer ports	3
Side exhaust	✓
Rear exhaust	



Comments. This slightly larger sibling of the Torq .16 has popular features such as ABC construction, a 2-needle carb and a true 90-degree exhaust port for more efficient exhaust flow. The crankshaft is cut so that the engine can be installed in the Overdrive ST truck, but it will fit any application that will accept a short crankshaft configuration.

DURATRAK DTX .18 \$155

Bore	16.6mm
Stroke	13.7mm
Piston/sleeve	ABN
Pull-start	✓
Non pull-start	
Slide carb	
Rotary carb	✓
Standard crank	✓
Short crank	
Pilot crank	
Standard plug	✓
Turbo plug	
Transfer ports	3
Side exhaust	✓
Rear exhaust	



Comments. This new DuraTrak engine was developed for the company's Nitro Evader ST and is made by O.S. Engines. This may be the first time O.S. has made an engine that doesn't carry its name, but O.S. quality shows. A slightly modified O.S. design, a 2-needle carb feeds the DTX .18, but it's fixed in position and can't be rotated. A nickel-plated sleeve is included, and if there's one company that makes this work, it's O.S.

ENGINE DISPLACEMENT BIGGER IS BETTER—FACT OR FICTION?

"Size matters." "There's no replacement for displacement." These are just two of the many assertions you'll hear in engine discussions. This assumption is based on a common belief that engines with larger displacements make more power than those with smaller displacements.

So, do they? All other factors remaining constant, yes: a larger engine will

DYNAMITE MACH .15 \$110

Bore	15mm
Stroke	14mm
Piston/sleeve	ABN
Pull-start	✓
Non pull-start	
Slide carb	
Rotary carb	✓
Standard crank	✓
Short crank	
Pilot crank	
Standard plug	✓
Turbo plug	
Transfer ports	3
Side exhaust	✓
Rear exhaust	



Comments. The Mach .15 was introduced powering the popular Team Losi Triple-XNT ready-to-run truck, and it has developed a reputation for reliability. The cylinder head features a paint or powder-type coating, which isn't as sharp and familiar as anodizing, but this engine is a solid performer and a solid value.

FANTOM FR-15 \$140 - \$170

Bore	15mm
Stroke	14mm
Piston/sleeve	ABC
Pull-start	✓
Non pull-start	✓
Slide carb	✓
Rotary carb	✓
Standard crank	✓
Short crank	
Pilot crank	
Standard plug	✓
Turbo plug	
Transfer ports	3
Side exhaust	✓
Rear exhaust	



Comments. The Fantom F15 is available in many flavors. Sport enthusiasts will appreciate the pull-start version with slide or rotary carb, while Outlaw racers and horsepower hounds will appreciate the slight increase in power that the non-pull-start version provides; it's also available in slide and rotary versions. The non-pull-start versions have boost chambers installed in the rear cover.

EPIC BIG BORE .18 \$170

Bore	16.4mm
Stroke	14mm
Piston/sleeve	ABC
Pull-start	✓
Non pull-start	
Slide carb	✓
Rotary carb	✓
Standard crank	✓
Short crank	
Pilot crank	
Standard plug	✓
Turbo plug	
Transfer ports	3
Side exhaust	✓
Rear exhaust	



Comments. This new Epic has been thoroughly tested, and it reportedly enjoys more power than the average sport engine as a result. Durable ABC construction, a 2-needle rotary carb and a choice of standard or pilot crankshafts should make it easy to install in most small-block applications.

MEGATECH M-16 \$100

Bore	15.4mm
Stroke	14mm
Piston/sleeve	ABC
Pull-start	✓
Non pull-start	
Slide carb	
Rotary carb	✓
Standard crank	✓
Short crank	✓
Pilot crank	
Standard plug	✓
Turbo plug	
Transfer ports	3
Side exhaust	✓
Rear exhaust	



Comments. The M16 has been a very popular replacement engine for the original T-Maxx, and it fits most other small-block applications by also being available in a standard crank version. Rotary- and slide-carb versions are available to further broaden the range of vehicles this engine will fit.

generally produce more power, assuming that it has been optimized to produce the most power for its displacement.

In reality, though, engines with similar displacements vary; some are optimized for all-out performance while others are designed to be sport engines. The latter are usually easier to start, tune and maintain, while racing engines give up some of this convenience to maximize horsepower. The more power you try to get out of an engine, the more critical tuning and general engine know-how become. A sport engine

of a larger displacement will not automatically outperform a smaller engine that has been tweaked for power; in fact, a smaller, race-bred engine will usually outrun a larger sport engine—even some of the big-block .21 "sport" engines!

The lesson to be learned is that a .12, .15, or .18 engine's maximum horsepower depends on many factors; larger engines aren't always the most powerful.



MEGATECH M-16Q \$90 - \$100

Bore	15.4mm
Stroke	14mm
Piston/sleeve	ABC
Pull-start	✓
Non pull-start	
Slide carb	
Rotary carb	✓
Standard crank	✓
Short crank	✓
Pilot crank	
Standard plug	✓
Turbo plug	
Transfer ports	3
Side exhaust	✓
Rear exhaust	



Comments. This new, factory-modified version of the M-16 is available in several versions, each specially designed to fit specific vehicles. One version includes an exhaust manifold, a silicone coupler and linkage to fit the new T-Maxx. The "A" version will include the clutch nut plus all the linkages to fit the RC10GT and the Nitro TC3. The "H" version includes all the linkages to install it in HPI vehicles. Finally, the "X" version includes all the required linkages and a clutch nut for the Losi Triple-XNT.

OMEGA XT-15 \$170 - \$200

Bore	15mm
Stroke	14mm
Piston/sleeve	ABC
Pull-start	✓
Non pull-start	✓
Slide carb	
Rotary carb	✓
Standard crank	✓
Short crank	
Pilot crank	
Standard plug	✓
Turbo plug	
Transfer ports	3
Side exhaust	✓
Rear exhaust	



Comments. This engine is made by Picco, which is well-known for competition-quality engines. The XT includes many high quality features such as ABC construction with a precision-honed piston sleeve, and it's available with and without a pull-start (the former version is popular with T-Maxx owners, and the latter will suit those who want a little more horsepower in bump-start applications).

NEO ST-16 \$70

Bore	15mm
Stroke	13.6mm
Piston/sleeve	ABC
Pull-start	✓
Non pull-start	
Slide carb	
Rotary carb	✓
Standard crank	✓
Short crank	
Pilot crank	
Standard plug	✓
Turbo plug	
Transfer ports	3
Side exhaust	✓
Rear exhaust	



Comments. The Neo ST 16 sport engine has a tall purple-anodized head. It features a 2-needle rotary carb with a standard threaded crank, which is the most popular configuration for small-block installations.

O.S. MAX .15 CV \$99 - \$130

Bore	15.2mm
Stroke	13.7mm
Piston/sleeve	ABN
Pull-start	✓
Non pull-start	✓
Slide carb	
Rotary carb	✓
Standard crank	✓
Short crank	✓
Pilot crank	
Standard plug	✓
Turbo plug	
Transfer ports	3
Side exhaust	✓
Rear exhaust	



Comments. The CV Series is legendary; these ideal sport engines offer good power and excellent reliability, and the .15 CV is no exception. The 10E rotary carb earns high marks for being easy to adjust and for having stable needle settings. In the States, the .15 CV is distinguished by the blue, paint-like accents on the distinctive square cylinder head. The "X" designation in the model's name denotes a pull-start version.

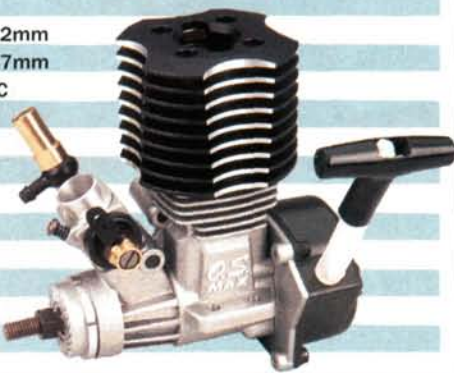


Gettin' cranky

Four uniquely different small-block-engine crankshaft styles are available, and choosing the right type will make your engine easy to install or difficult—even impossible—to install. Crankshafts may be short or of standard length, and they may be threaded, or pilot-shaft cranks.

O.S. MAX .15 CV-R \$150 - \$220

Bore	15.2mm
Stroke	13.7mm
Piston/sleeve	ABC
Pull-start	✓
Non pull-start	✓
Slide carb	✓
Rotary carb	✓
Standard crank	✓
Short crank	✓
Pilot crank	✓
Standard plug	✓
Turbo plug	✓
Transfer ports	3
Side exhaust	✓
Rear exhaust	



Comments. This is the high-performance series of side-exhaust engines from O.S. Not all the engines offer every combination of options, but the 15 CV-R is available in more varieties than any other engine; you'd be hard pressed to find an application that this engine wouldn't fit. The combination of ABC construction and O.S. quality and reliability also makes this combo hard to beat.

ORION WASP .18 \$150

Bore	16.4mm
Stroke	14mm
Piston/sleeve	ABC
Pull-start	✓
Non pull-start	✓
Slide carb	✓
Rotary carb	✓
Standard crank	✓
Short crank	
Pilot crank	✓
Standard plug	✓
Turbo plug	
Transfer ports	3
Side exhaust	✓
Rear exhaust	



Comments. The Wasp .18 is the "Outlaw" engine in the Orion lineup by virtue of its displacement. This prototype shows a carb with a fixed position, but production specs have not been finalized. Making this big engine versatile is the fact that it's available with a choice of slide or rotary carb and with or without a pull-starter.

OPS PRO .15 \$120 - \$140

Bore	15mm
Stroke	13.9mm
Piston/sleeve	ABC
Pull-start	✓
Non pull-start	✓
Slide carb	
Rotary carb	✓
Standard crank	✓
Short crank	
Pilot crank	
Standard plug	✓
Turbo plug	
Transfer ports	3
Side exhaust	✓
Rear exhaust	



Comments. OPS engines are reasonably priced and well-featured for sport/club racers. They are available in pull-start and non-pull-start versions with a slide carburetor and a threaded crank of standard length. The Pro .15 features ABC construction and a true, 90-degree side-exhaust port. The carb's position is fixed so that the engine can be mounted in only two positions.

PEAK RACING DIABLO .15 \$140

Bore	Not available
Stroke	Not available
Piston/sleeve	ABC
Pull-start	✓
Non pull-start	✓
Slide carb	✓
Rotary carb	✓
Standard crank	✓
Short crank	
Pilot crank	✓
Standard plug	✓
Turbo plug	
Transfer ports	3
Side exhaust	✓
Rear exhaust	



Comments. Peak has a long tradition in national- and world-championship electric racing, and it has now decided to get into nitro as well. The Peak Diablo .15, much like the rest of the engines featured here, is too big for sanctioned racing, but there's a non-pull-start version and a pull-start version. Aside from the usual trappings, the Diablo looks as if it will also be available with a very large boost bottle and all the necessary installation hardware.

A threaded crankshaft has threads right to its tip; the pilot-shaft crankshafts have a short threaded section close to the engine block and a smoothly machined section near the tip.

> **THREADED CRANKSHAFT.** This is intended to have a combination flywheel nut/pilot shaft threaded onto its end. The nut secures the

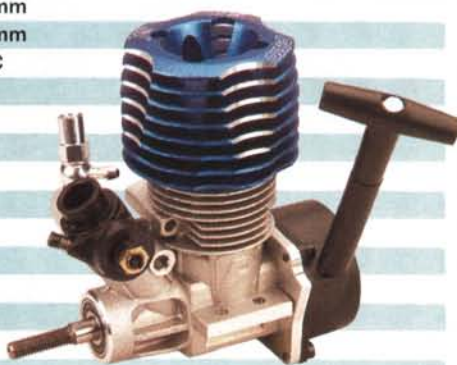
flywheel to the engine; a bolt-on pilot shaft is required with a threaded crankshaft. This is the configuration most often used in sport applications and cases where a car manufacturer chooses a clutch and flywheel configuration that makes it difficult to use the more specialized pilot-shaft design.

> **PILOT-SHAFT CRANKSHAFTS.** The pilot shaft is part of the crankshaft, and the flywheel is secured by an ordinary nut. This design is less likely to cause vibration because it's part of the crankshaft.

Consult your owner's manual to determine which type is most appropriate for your car.

PICCO XP-15 \$160 - \$200

Bore	15mm
Stroke	14mm
Piston/sleeve	ABC
Pull-start	✓
Non pull-start	✓
Slide carb	
Rotary carb	✓
Standard crank	✓
Short crank	
Pilot crank	
Standard plug	✓
Turbo plug	
Transfer ports	3
Side exhaust	✓
Rear exhaust	



Comments. Notwithstanding its Outlaw designation, the XP-15 has the same quality and features as you'll find in Picco's racing engines. It's available with and without a pull-starter and with two types of side exhaust, and it's available with a true 90-degree side exhaust or a round "Picco" exhaust port (it's much like those you find on rear-exhaust engines, but it's on the side).

SIRIO 3.0 TX-18 \$250

Bore	15.8mm
Stroke	14.4mm
Piston/sleeve	ABC
Pull-start	✓
Non pull-start	
Slide carb	✓
Rotary carb	
Standard crank	
Short crank	
Pilot crank	✓
Standard plug	✓
Turbo plug	
Transfer ports	5
Side exhaust	
Rear exhaust	✓



Comments. The 5-port Sirio 3.0 TX-18 was designed to be a direct replacement engine for the T-Maxx 2.5. It has a larger displacement than the one it replaces, and it accepts the EZ-Start 2 onboard electric starting system that comes with the truck. It comes with a header and header springs to adapt it to the stock exhaust pipe; an aluminum tuned pipe is also an option. The unique rear exhaust requires the special Sirio header, so this engine will need more header designs to fit vehicles other than the T-Maxx.

SIRIO S15TUP AF \$230

Bore	14.83mm
Stroke	14.2mm
Piston/sleeve	ABC
Pull-start	
Non pull-start	✓
Slide carb	
Rotary carb	✓
Standard crank	✓
Short crank	
Pilot crank	✓
Standard plug	
Turbo plug	✓
Transfer ports	5
Side exhaust	
Rear exhaust	✓



Comments. Even though it's an "Outlaw," this is one of the most competition-oriented engines in our group. It's a non-pull-start rear-exhaust with 5 real intake transfer ports, a plug designed for a turbo head, a turbo-ported crank and an oversize carburetor to help feed it (production engines will supposedly include a rotary carb). It isn't as polite as many of the other engines here, so it may not be for newcomers, but it's certainly a strong mill for those who have engine experience.

TRAXXAS PRO .15 \$90 - \$100

Bore	15.1mm
Stroke	13.9mm
Piston/sleeve	ABC
Pull-start	✓
Non pull-start	
Slide carb	
Rotary carb	✓
Standard crank	✓
Short crank	✓
Pilot crank	
Standard plug	✓
Turbo plug	
Transfer ports	3
Side exhaust	✓
Rear exhaust	



Comments. This was the Traxxas standard bearer for years in most of the company's upscale vehicles—most notably the T-Maxx before it was replaced by the TRX 2.5. It's still the standard engine in the Nitro Sport SE and the Nitro Stampede. When included in these vehicles, it will have an electric onboard starter attached, but it's available with and without a pull-starter.

What is it that makes most Italian engines so powerful? Is there some "secret" ingredient that automatically makes engines from Italia more powerful?

Italian RC engine manufacturers really like to build racing engines. Racing and competition are in their blood and are a rich part of the Italian motorsports tradition. Like Italian auto manufacturers whose real passion is for high-performance street and racing machines, Italian RC engine manufacturers will build sport

ITALIAN POWER

engines if they must, but their focus on high-end racing engines gives them a lot of practice that makes them very good at what they do.

The tangible elements that have earned the Italian engines their reputation for great power are the quality of the materials used in their construction and the precision with which the parts are machined and fit together. It's the

total package that counts.

Engines made outside Italy are no less powerful or less worthy of praise, but discussions about really powerful engines always seem to include a Sirio, a Rossi, a Novarossi, a Picco, or an OPS—or any of the other brand of engines made by these manufacturers. Some of these are, in fact, so focused on building racing engines that they aren't included in this guide because they don't yet make a "larger-than-legal" small-block engine.

TRAXXAS TRX 2.5 \$150

Bore	14.73mm
Stroke	14.73mm
Piston/sleeve	ABC
Pull-start	✓
Non pull-start	✓
Slide carb	✓
Rotary carb	
Standard crank	
Short crank	
Pilot crank	✓
Standard plug	✓
Turbo plug	
Transfer ports	3
Side exhaust	
Rear exhaust	✓



Comments. Not much can be said about the TRX 2.5 that hasn't already been said. It's a well-made, powerful engine that is also a great value. The TRX will be available with and without a pull-starter; electric-start versions are reserved for Traxxas vehicles. The pilot crank is the short type, so the engine will obviously fit any Traxxas vehicle and the Associated RC10GT and Nitro TC3. A special rear exhaust flange requires the use of the 90-degree Traxxas header that's now used in truck and touring applications.

YOKOMO RX-18 \$130

Bore	16.4mm
Stroke	13.4mm
Piston/sleeve	ABN
Pull-start	✓
Non pull-start	
Slide carb	
Rotary carb	✓
Standard crank	
Short crank	✓
Pilot crank	
Standard plug	✓
Turbo plug	
Transfer ports	3
Side exhaust	✓
Rear exhaust	



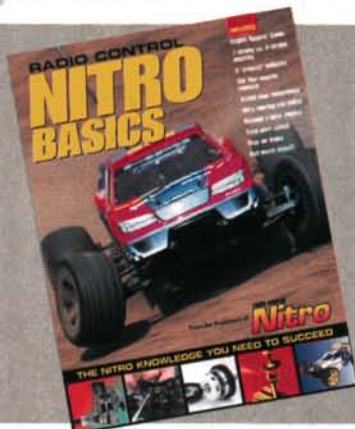
Comments. This is one of the first "18" engines on the market, and it was introduced powering Yokomo's GT4 RTR touring car. It has a single-needle carb, which limits the range in which the fuel mixture will be ideal, but it's a solid performer that's reasonably priced. It has a 17mm-long (medium) threaded crank from the front bearing. Be sure to check your application for minimum crankshaft length.

Horsepower ratings

"How much horsepower does that engine have?" This question is one of the most frequently asked with regard to a new engine. So, why no horsepower ratings in this engine guide? Because manufacturers use differing methods to estimate their engines' horsepower. Some calculate the likely power output mathematically, on paper, and others use a dyno to test their engines. And those who use dynos use different dynos, so their results can't be directly compared. A manufacturer's engine ratings might be useful guides to the relative power produced by engines in its own line, but the information can't be used to compare one brand with another. For more accurate figures that will allow you to compare engines of many brands, refer to the engine dyno-testing features we regularly publish in our sister publication, *RC Nitro* magazine.

SOURCE GUIDE

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RACER NEWS

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BY GEORGE M. GONZALEZ & JASON SAMS

Mike Dumas switches rides

Mike Dumas has decided to switch teams and will now drive for Team Losi. He will race the Triple-XS sedan and plans to use Phantom motors and batteries. An on-road specialist, Dumas is always in the A-main mix at national events, so his experience will certainly be an asset to the growing Losi racing program. His latest big win was at the U.S. Indoor Championships, where he outraced a star-filled field and was crowned the champion.

Racers raise big bucks for a good cause

Albuquerque Hobbies in Albuquerque, NM, hosted its first Race Against Cancer. The racers raised \$7,000, all of which was donated to the American Cancer Society. The Racers against Cancer chairman, Adam Drake, cleaned up at the event; he won the 2WD Modified, 2WD Stock and 4WD Modified classes.

SITE SEEING



Take a look at this great website. It has many free programs that you can download to help you design banners, desktop wallpaper and even your own logo. You can really come up with some cool decal designs using the programs available, so be sure to check it out.

BOARD WALK

FROM THE
RADIOCONTROLZONE
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The great battery debate

ROBTA004CAMP0: Should I charge my batteries a week or two before I use them and then re-peak them? Or is it better to leave my batteries without a charge?

LORDADEON: Store Ni-Cd batteries discharged. NiMH batteries should be stored with at least a 10-percent charge.

RCNERD: Never over-charge your cells, and be sure to let the pack cool down for at least 30 minutes before you charge them again.

K-SW31: I usually cycle my packs two to three times before a run.

Severe airbrush problems

IBANEZCOLLECTOR: My water-based paint doesn't adhere to the body. I cleaned the body really well, so why doesn't the paint stick?

DROPHICKED: Try warming up the body with a hair dryer before you apply the paint.

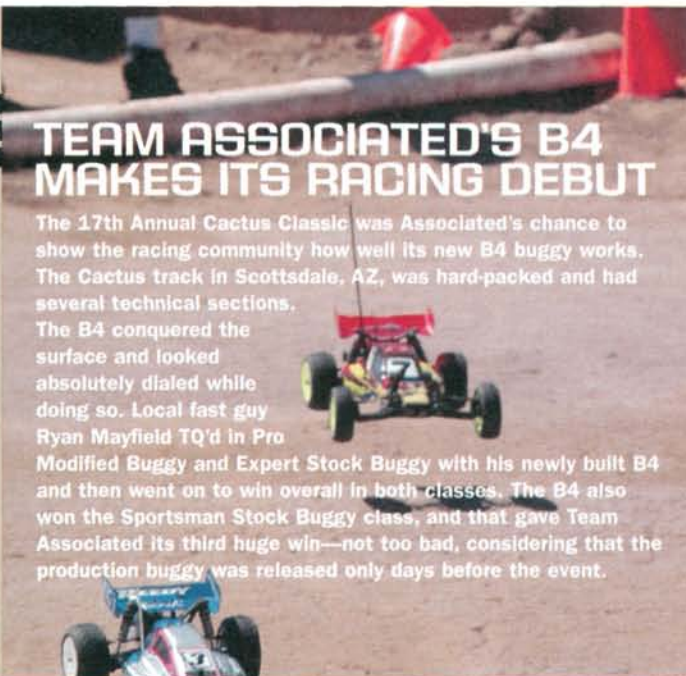
SKIDMARK RACING: Don't let your body air dry; that leaves water spots that contain mineral deposits. To prep it for painting, use a lint-free cloth to dry the body after you wash it.

YENDOR: Spray at 40psi and just mist it, and use a hairdryer to dry the paint before you apply the second coat. Water-based paints won't stick if there are oily marks inside the body from your hands or if you've sprayed the first coat on too thickly.

BE HEARD! LOG ON AT
RADIOCONTROLZONE.COM

TEAM ASSOCIATED'S B4 MAKES ITS RACING DEBUT

The 17th Annual Cactus Classic was Associated's chance to show the racing community how well its new B4 buggy works. The Cactus track in Scottsdale, AZ, was hard-packed and had several technical sections. The B4 conquered the surface and looked absolutely dialed while doing so. Local fast guy Ryan Mayfield TQ'd in Pro Modified Buggy and Expert Stock Buggy with his newly built B4 and then went on to win overall in both classes. The B4 also won the Sportsman Stock Buggy class, and that gave Team Associated its third huge win—not too bad, considering that the production buggy was released only days before the event.



Tamiya hosted the 4 Hours of Tamiya Enduro Race for a second year, and many well-known racers competed. The racers were organized in teams of four or more. Each team decided

BRUSHLESS MOTORS DOMINATE THE TAMIYA ENDURO RACE

which racer would drive and when as well as who would help with the many battery-pack pit stops required to keep the cars rolling for more than 4 hours.

The top three finishers raced with brushless motor systems and 3300mAh NiMH cells. Four Team Novak teams finished among the top 10, with two of them earning first and second. Tyree Phillips led the Novak team to its first ever



victory; with the new Super Sport brushless motor system, the team averaged an astounding 9.6 minutes of run time from each battery pack. This was no small feat because the ESCs were programmed at their most powerful setting, which provides power equivalent to a hand-wound, 10-turn, modified brush-type motor (according to Novak). Brian Dunbar finished third; he drove with Team Orion's second-generation Vortex brushless motor system.

“Could the girls in Arizona be any hotter?”

—Doug Scripture, who noticed the beautiful scenery at the Cactus Classic

SPEED SHOP



HARDCORE RACING COMPONENTS

Upgrades for Associated Nitro TC3

These TC3 parts are the latest items to be freed from billet by Hardcore's bank of CNC machines, and they're perfectly finished and ready for direct, bolt-on installation. The steering knuckles include nylon pivot-ball retainers, and the shock tower's 6AL4V titanium-billet mounting brace can be used on the front or rear. All are available in blue, green, purple and silver.

Front/rear shock tower (silver) item no.—HCR-02644; \$59.

Aluminum rear-hinge-pin block (silver)—HCR-02654; \$32.

Aluminum front bumper/hinge-pin block (silver)—HCR-02664; \$63.

Steering knuckles (silver)—HCR-02594; \$59.

Hardcore Racing Components (661) 294-5032; racinghardcore.com.

OPTION TEAM BY FIORONI Foam tires

Tires are critical in 1/8-scale on-road racing, so it pays to get the good stuff. Option Team by Fioroni has top-quality foams to fit your Serpent and Mugen machines in a variety of compounds labeled by shore rating. The tires are mounted and trued on original-equipment-type 6-spoke wheels for Mugen cars and 16-spokers for Serpents.

Foam tires 1/8-scale on-road (pair)—item nos. vary with compound (F/R); \$19.99/\$25.99.

Option Team Parts by Fioroni; distributed by General Sillicones Co. USA (626) 338-3815; generalsillicones.com.



OPTION TEAM BY FIORONI Adjustable Power Clutch for Associated TC3

Option Team's 3-shoe, Centax-style clutch isn't like others you've seen. Instead of juggling shims to adjust the play between the clutch shoes and clutch bell, you can just dial the play out with the adjusting nut that's on the end of the assembly. The Power Clutch includes all of the bearings and hardware required for installation, and it features flawless machine work with tasteful blue and silver anodizing. Hey, going fast is great, but looks count, too.

Adjustable Power Clutch for TC3—OT-CX03; \$104.99.

Option Team Parts by Fioroni; distributed by General Sillicones Co. USA (626) 338-3815; generalsillicones.com.

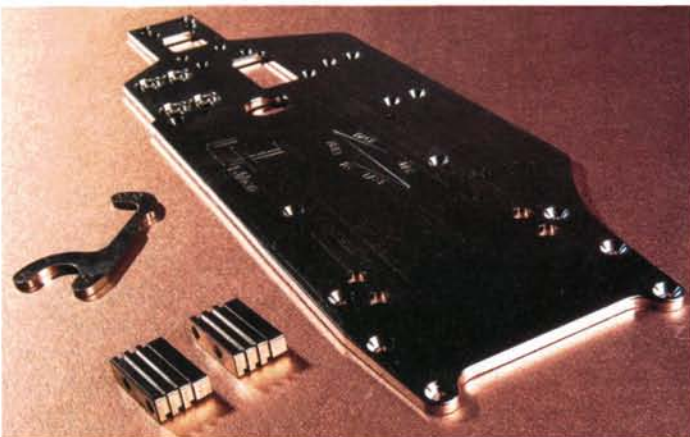
REEDY/YOKOMO GP 3300 X-Cells

Reedy starts with Yokomo Z3300HVR NiMH cells and then gives them the same cycling/matching/voltage-enhancing treatment as the IFMAR Worlds-winning cells used by Associated's team drivers. The best cells go into X-Cell packs, so you'll get 6 of the punchiest, longest-lasting batts available. Reedy/Yokomo GP 3300 X-Cells 6-cell pack—665; \$90.

Reedy; a division of Team Associated (714) 850-9342; teamassociated.com.



SPEED SHOP



DACE MANUFACTURING

Chassis for Team Losi Triple-XNT

Nickel plating sets Dace Mfg.'s 6061 T6 aluminum chassis apart from the stock parts, and Dace claims that it's lighter and stiffer than stock, too. A transmission brace is included, and no modification is required to install the parts. Dace also offers finned engine mounts for the XNT with a nickel finish to match the chassis.

Triple-XNT chassis—DL4019N; \$45.60.

Triple-XNT engine mounts—DL9336N; \$15.50.

Dace Mfg. (209) 543-0299; dacemfg.com.

POWERS HOT WORKS

Racing Factory wheels

OK, OK; we know that real racers run dish wheels. But if you're slugging it out in the C-main, don't you want to at least look good? Hot Works has some of the best-looking hoops for your touring car in three styles and all kinds of colors. The painted wheels have chrome-plated rims and accents for a scale and stylish look, and you can also get all three styles in gold-plated (simulated, of course) and solid-chrome finishes.

Hot Works Racing Factory wheels—item nos. vary with style and color; \$12.99/set of four.

Powers Hot Works; distributed by Schumacher USA (813) 889-9691; racing-cars.com.



TRACK THREADS



RINGERS Mechanics gloves

If you're into nitro, a good pair of gloves is a must for working on a hot engine or wrangling wrecked cars while marshaling a qualifier. Spandex backs, unpadded Clarino split palms and hidden seams give your hands maximum dexterity and protection while you wrench. You can get Ringers in blue, black and red in small through XXL sizes.

Ringers gloves—item nos. vary with size and color; \$25.

Ringers; distributed by Hardcore Racing Components (661) 294-5032; racinghardcore.com.



TAMIYA TA-04SS hard suspension arms

Tamiya's line of "hard," molded-graphite parts now includes the forward-swept rear arms used by the short-wheelbase variant of the TA-04S chassis. The graphite parts are lighter and stiffer than stock, and they can be used to convert a standard TA-04 to the short-wheelbase configuration. You also get a pair of front arms in the package. Molded-graphite suspension arms for TA-04SS—OP-578; \$17.

Tamiya America Inc. (800) 826-4922; tamiyausa.com.

UNDER THE HOOD

Chad Bradley's
Mugen MST-1

RACE GEAR

Transmitter: Airtronics M8

Receiver: Airtronics 92836

75MHz FM

Steering servo: Airtronics 94357

Throttle servo: Airtronics 94737

Engine: Mugen MT-12

Pipe: O'Donnell no. 2

Fuel: O'Donnell 20 percent

Tires (F/R): Pro-Line

Step-Pin/LugNut T (M3)

Body: Pro-Line

Gearing: 17/60

Clutch: Stock Mugen

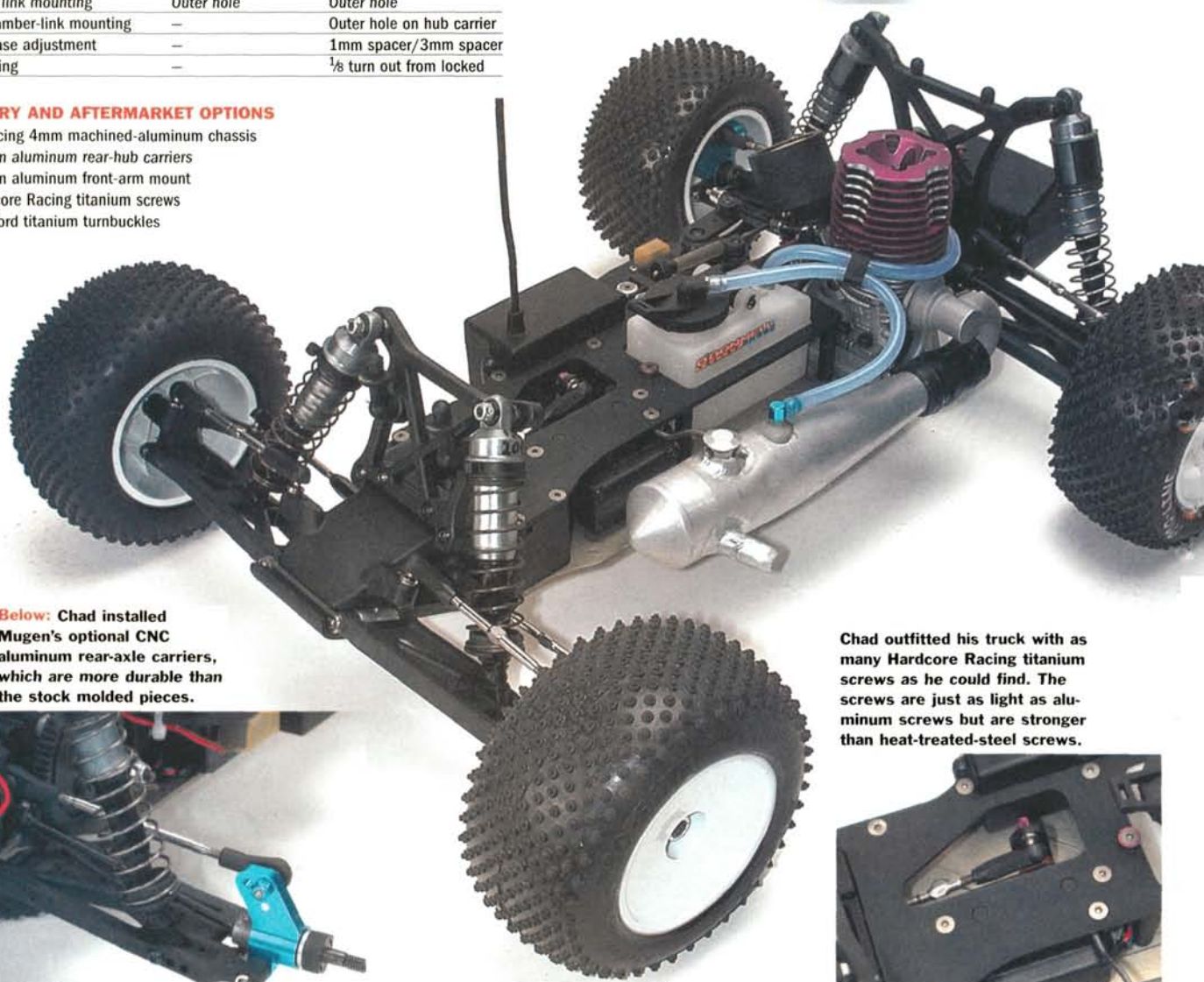
SETUP

	FRONT	REAR
Camber	1 deg. negative	0.5 deg. negative
Toe-in	1 deg.	5 deg.
Ride height	Arms level	Arms slightly above level
Front ball-stud spacer	1mm (inner)	0 (outer)
Shock fluid	200WT (Mugen)	300WT (Mugen)
Shock piston	1.5mm	1.6mm
Shock spring	Firm	Firm
Shock-tower mounting	Middle hole	Outer hole
Arm mounting	Middle hole	Inner hole
Camber link mounting	Outer hole	Outer hole
Outer camber-link mounting	—	Outer hole on hub carrier
Wheelbase adjustment	—	1mm spacer/3mm spacer
Diff setting	—	1/8 turn out from locked

FACTORY AND AFTERMARKET OPTIONS

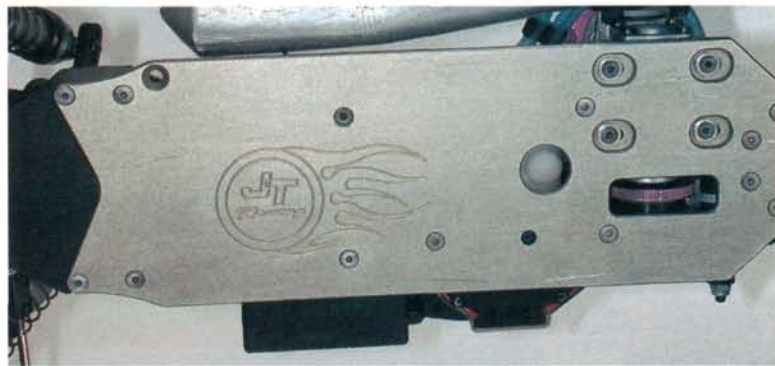
- JT Racing 4mm machined-aluminum chassis
- Mugen aluminum rear-hub carriers
- Mugen aluminum front-arm mount
- Hardcore Racing titanium screws
- Lunsford titanium turnbuckles

Below: Chad installed Mugen's optional CNC aluminum rear-axle carriers, which are more durable than the stock molded pieces.



Chad outfitted his truck with as many Hardcore Racing titanium screws as he could find. The screws are just as light as aluminum screws but are stronger than heat-treated-steel screws.





This JT Racing 4mm-thick, machined-aluminum chassis is sweet. The extra-thick chassis prevents unwanted flex and allows the suspension to work more effectively. Although you can't see it here, the chassis is milled in various places on the other side to reduce weight without sacrificing rigidity. The machined JT Racing logo looks really cool.



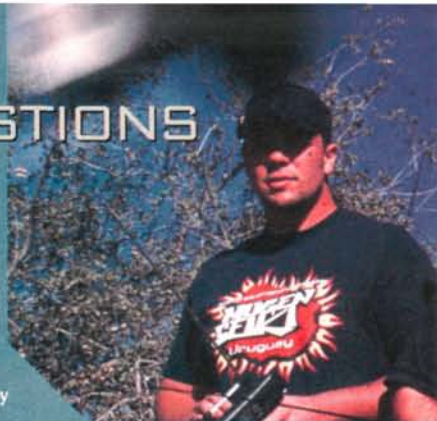
The exhaust generated by the Novarossi-built, Mugen MT-12 engine is directed through the stock Mugen rear-exhaust, 90-degree manifold and O'Donnell tuned pipe. This truck rips! Check out the 90-degree pressure fitting that Chad secured to the pipe with JB Weld.



FACTORY DRIVER HOT MOD

Chad slightly enlarged the stock 1.5mm holes in the rear shock pistons with a 1.6mm drill bit to provide a little less damping resistance. He also writes the piston size and shock fluid weight on his shock caps with a black permanent-ink marker to keep track of what's going on inside the shock bodies. This is a great tip—especially if you race several vehicles.

5 QUESTIONS



DRIVER: Chad Bradley

AGE: 24

LAST BIG WIN: '01 ROAR 1/8-scale Off-Road Nationals

SPONSORS: Mugen, Pro-Line, O'Donnell, Airtronics and JT Racing

WHEN I'M NOT RACING: I've been boxing for about a year and half now, and I try to get to the gym a few times a week as well.

RADIO CONTROL CAR ACTION: You've come a long way over the last few years; to what do you credit your recent racing successes?

CHAD BRADLEY: Well, getting support from all my sponsors is a great help, living in Southern California and being able to race at so many cool tracks every weekend is a plus, and having the confidence that I know I'm capable of winning races.

RCCA: The Silver State Nitro Challenge is right around the corner. Have you been practicing for this event? Do you think that the Mugen team has what it takes to dethrone the Kyosho team this year?

CB: It will be very hard to beat all the great drivers that Kyosho has, but Mugen also has a very strong team, and our 1/8 and 1/10 cars are very good on big tracks like those in Vegas. I think the tables will turn with Kyosho when we start driving the new MBX-5 car. I've seen the CAD drawings, and that thing looks mean!

RCCA: I've heard that you airbrush all of your RC bodies. Do you paint bodies for other racers, or do you just do it for yourself for fun?

CB: I do paint all of my own stuff. I used to paint bodies for others, but it is just so time-consuming. I've painted bodies for Pro-Line a couple of times and even had some of my paint jobs featured in magazines. With work and racing, however, it's getting tough to find the time to paint my own bodies. Do you know of any good painters that will work for next to nothing?

RCCA: It was a blast to race nitro touring cars at KZ Speedway with you. I can't believe that was the first time you had driven a nitro touring car because your lap times were right up there with the established track record. Do you now plan to compete at some of the larger nitro touring car races this year?

CB: Mugen makes some of the best on-road cars. I've heard so much good stuff about the MTX-3 that I just had to order one. After driving it, all I could say is that it drives like a dream; everything that I had heard about it was true. I'm going to try to race the Nitro Touring Nats this year and possibly the 1/8-scale Worlds this September at KZ Speedway. I've definitely caught the on-road bug.

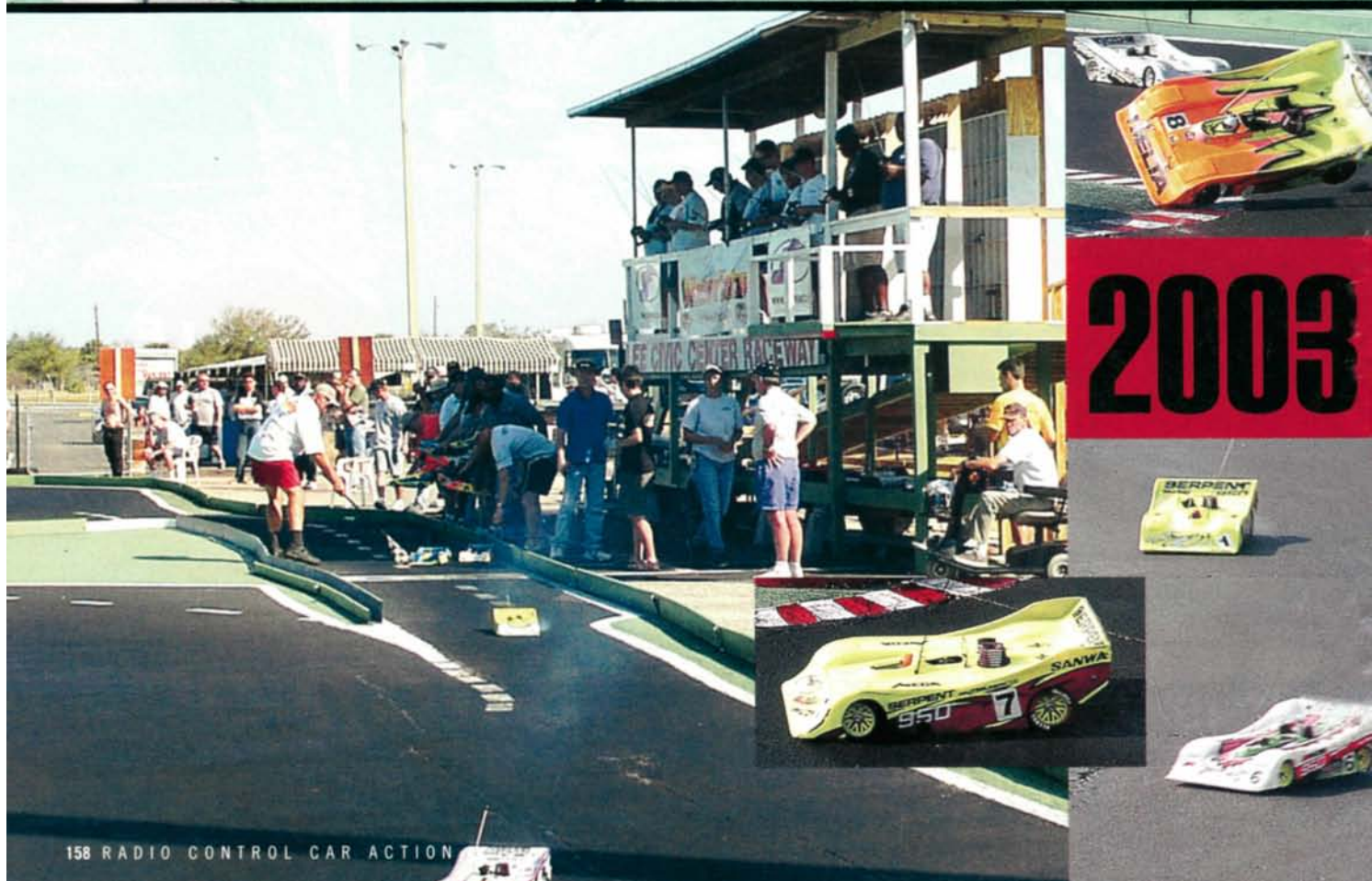
RCCA: What about electric off-road or on-road? Do you plan to race electric vehicles, or will you stick with your nitro forte?

CB: I plan to buy the new Stealth B4 buggy just to help polish my driving skills. I plan to go to SoCal raceway every once in while to club race, but I'm not planning on any big electric events for now.

RCCA: Buy a B4 buggy? You should ask Team Associated to sponsor you! ■



PHOTOS BY MIKE MYERS





Left to right: Michael Salven— $\frac{1}{8}$ -scale 4WD winner; Barry Baker—200mm Sedan winner; and Juan Prohías—235mm 4WD winner.



Florida Winter Nats

SPONSORED BY SERPENT USA

by Mike Myers

ASSOCIATED AND SERPENT TAKE THE GOLD

THE SOUTHERN GAS CHAMPIONSHIPS, officially dubbed the Florida Winter Nationals, is the first big nitro on-road race of each new season, and this year's race in sunny Ft. Myers, FL, was the biggest and best yet. Due to popular demand, a 200mm sedan class was added to the existing $\frac{1}{10}$ and $\frac{1}{8}$ 4WD Open classes. The maximum number of contestants was increased to 174, and to accommodate the additional racers, the event's duration was expanded to a full week. The Ft. Myers RC Car Club's preparations included repainting the track and enlarging the drivers' stand, and the members' hard work really paid off in smooth racing action.



QUALIFYING

During the qualifying tech inspection for the new 200mm class, 19 cars were disqualified in the first round for fuel tanks that were too large, wings that were too high and cars that were underweight. But, fortunately, all this was quickly sorted out as racers learned how to make their cars legal.

After two solid runs, Trinity/Kyosho driver Josh Cyrul topped the qualifying roster in $\frac{1}{8}$ scale. Michael Salven's good first run with his Serpent 950 didn't hold after a collision in round 2. In 200mm, Mugen factory driver Kenji Osaka was the one to catch. He was hotly pursued by Team Associated's Barry Baker, Marty Barnes and Serpent driver Ralph Burch, who all trailed him by 3 to 4 seconds.

On Tuesday, Salven was TQ in $\frac{1}{8}$ scale, and Kenji remained firmly in control of 200mm. Serpent driver Don Jones took TQ in 235mm. Friday's qualifying brought no changes at the top, although the field was shuffled around. The top nine racers in each class qualified for the 60-minute A-main, and one racer was bumped up from the B-main.

A-MAIN ACTION

$\frac{1}{8}$ -SCALE 4WD. For many racers, the $\frac{1}{8}$ -scale A-main was the highlight. Everyone at the track watched the best of the best—Kyosho, Mugen, HPI and Serpent—battle for bragging rights on the demanding Ft. Myers track.

TQ Michael Salven's clean start enabled him to pull away from the field with his Serpent 950, while Masao Tanaka, Ralph Burch, Marty Barnes, Josh Cyrul and Chris Reade scrimmaged for position. After 4 minutes, Tanaka, in second, suffered radio problems and dropped out. Cyrul took his place, and Burch was third. Suddenly, Cyrul hit a board, which took him out of the race for repairs.

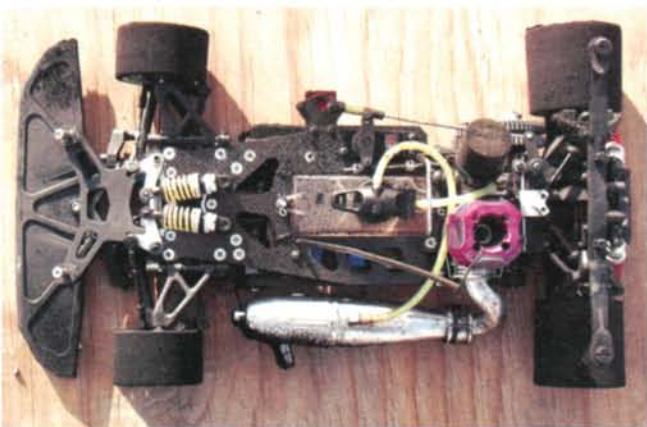
After 20 minutes, the order was Salven, Keisuke Fukuda and Burch—Serpent versus Mugen. Cyrul rejoined the race, but his chances of regaining the lost time were slim. At the halfway point, Fukuda brought in his Mugen MRX-3 for a tire change. Salven was now being followed by Burch, whose engine required a quick pit stop for re-tuning, and that gave Salven a cushy $\frac{3}{4}$ -lap lead.

Burch gradually decreased the lead to about 3 seconds until his Serpent 950 ran out of fuel ... and so it went. After 1 hour and 219 laps, Salven rolled in for the championship. Fukuda claimed second with 217 laps; Burch was third with 212.



Above: the $\frac{1}{8}$ -scale 4WD winners (left to right)—Keisuke Fukuda (second), Michael Salven (first) and Ralph Burch Jr. (third).

Below: and you thought that only off-road cars get dirty! This is Michael Salven's class-winning Serpent 950.





Far left: the top three finishers for the 235mm 4WD class (left to right)—Jim Herrmann (second), Juan Prohias (first) and Lazaro Alonso (third).

235MM 4WD

Serpent driver and TQ Don Jones failed to put on a good show because of consistent radio problems from beginning to end. It came down to a bunch of fast-racing enthusiasts, as no "factory" racers participated. Lazaro Alonso drove his Serpent 835 fastest, but he also had engine-tuning problems. Only about half the field finished the race. Terry Bryant lasted 17

minutes and Garen Hagoian, 27. Daniel Onorato ran for 28 minutes, and Vince Tate made it to 40. Only five cars lasted the full 45 minutes. The winner was local Miami racer Juan Prohias, who, with his Serpent Impact, had led for most of the race.

200MM 4WD SEDAN



TQ Kenji Osaka's Mugen MTX-3 got sideways in the first turn, so all the other cars made their way around him. Burch, Cyrul and Baker got by cleanly, but the rest got tangled up. Cyrul led until he got out of balance in the sweeper and traction-rolled. Burch lost his lead to Baker during the first pit stop. Five minutes into the race, it was Baker, Cyrul, Burch.

Baker's Associated Nitro TC3 quickly built a 1/4-lap lead over Cyrul and Burch. After 10 minutes, Cyrul had engine troubles that needed

attention in the pit. This left Burch in second, trailing the leader by one lap. Osaka's Mugen MTX-3 picked up speed and was soon third behind Burch. With 15 minutes left, Baker had completed 127 laps, and Burch and Osaka had 124 each.

Baker continued to cruise, just trying to stay out of trouble. He bumped a board and lost a ball cup—back to the pits for a quick repair. Suddenly, with Burch and Osaka being first and second, everyone paid attention.

With 8 minutes left, Burch tried to stay in control, but engine problems again forced him into the pits, and Osaka now led. With 5 minutes to go, Osaka took the hairpin turn at the finish line a little too tightly; he bumped the board and flipped over. Baker seized the moment for a big win in the 200mm class, Osaka was second, and Andy Wallis, driving a Schumacher Fusion, came in third.

Barry Baker's Nitro TC3 was dialed for the track to bring him first-place honors.



Above: the 200mm 4WD Sedan class produced one of the weekend's most exciting finishes, and the top two winners are (left to right) Barry Baker (first) with his Associated Nitro TC3 and Kenji Osaka with his Mugen MTX-3. Great job, guys!



WINNERS

1/8 4WD

FIN.	QUAL.	DRIVER	CHASSIS	ENGINE	LAPS	TIME
1	1	Michael Salven	Serpent 950	NovaMega	219	45:04.9
2	3	Keisuke Fukuda	Mugen MRX-3	JP Rx-21	217	45:02.6
3	5	Ralph Burch Jr.	Serpent 950	NovaMega	212	45:01.5
4	6	Marty Barnes	Serpent 950	NovaMega	210	45:05.8
5	7	Chris Reade	Mugen MRX-3	Novarossi	205	45:03.3
6	10	Paolo Morganti	Serpent	NovaMega	178	45:01.9
7	4	Josh Cyrul	Kyosho	Sirio	131	33:38.3
8	8	David Spashett	Kyosho	Sirio	127	27:30.1
9	2	Masao Tanaka	Mugen MRX-3	JP	21	04:11.5
10	9	Jared Scott	Serpent 950	NovaMega	18	05:22.3

200MM SEDAN

1	4	Barry Baker	Associated NTC3	O'Donnell Picco	188	45:09.6
2	1	Kenji Osaka	Mugen MTX-3	Mugen MR12	188	45:12.3
3	9	Andy Wallis	Schumacher Fusion	Paris Engine	180	45:11.1
4	3	Ralph Burch Jr.	Serpent 705	NovaMega	179	45:02.4
5	6	Tim Long	Mugen MTX-3	Mugen MR12	173	43:11.5
6	8	Robbie Collins	Mugen MTX-3	Novarossi	161	45:03.6
7	5	Marty Barnes	Serpent 705	NovaMega	160	45:13.8
8	2	Josh Cyrul	Trinity Reflex	Sirio	155	39:27.7
9	7	Bobby Horan	GS Vision	Paris Engine	153	45:09.3
10	10	Ron Rossetti	Mugen MTX-3	Omega	129	34:48.6

235MM 4WD

1	5	Juan Prohias	Serpent Impact	NovaMega	189	45:01.73
2	7	Jim Herrmann	Serpent 835	NovaMega	178	45:06.21
3	3	Lazaro Alonso	Serpent 835	NovaMega	167	45:11.75
4	8	Julian Hope	Serpent Impact	NovaMega	160	45:00.03
5	9	Kelly Bean	Serpent 835	NovaMega	160	45:13.56
6	10	Vince Tate	Serpent Impact	NovaMega	137	40:21.28
7	2	Daniel Onorato	Serpent Impact	NovaMega	94	28:43.50
8	6	Garen Hagoian	Serpent Impact	NovaMega	92	27:15.49
9	4	Terry Bryant	Mugen Avance	Mugen	75	17:59.97
10	1	Don Jones	Serpent 835	NovaMega	55	45:12.05



Marshaling one of these on-road events requires plenty of dexterity, quickness and a cool boonie hat.

WRAP-UP

The '03 Florida Winter Nats racing action was as good as it gets, and everything ran smoothly. All the "big guns" were there, the track was beautifully prepared, and the weather was wonderful. We congratulate Michael Salven, Barry Baker and Juan Prohias on their victories and thank race director Jim Rice and the Ft. Myers RC Car Club crew for their excellent track and professional management. ■

5 Ways to Maintain & Store your Nitro Equipment

by Stephen Bess

Experienced nitro bashers and racers maintain their equipment regularly to ensure consistent performance whenever they go out to burn nitro. Without a maintenance routine, you may soon find your equipment worn out and your vehicle's performance showing the consequences. A little organization goes a long way here. If having fun means running without interruptions caused by malfunctioning equipment, this article is for you.

Storing fuel

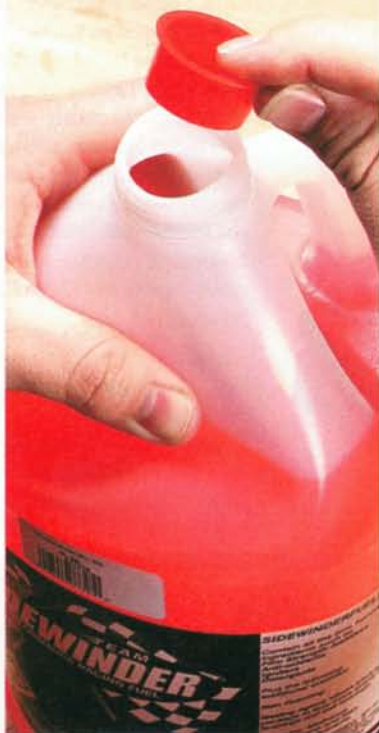
Although hardcore racers may go through a gallon of fuel in a weekend, most of us can expect a gallon of fuel to last quite a long time, and that's why it's important to store it properly. Nitro fuel is toxic, so store it out of the reach of children who may think it's Kool-Aid. Nitro fuel is also "hygroscopic"; this means that it attracts water and moisture like a sponge. Water-diluted fuel will ruin your day and force you to buy a fresh gallon, so take the following precautions when you store your fuel:

- **Avoid temperature extremes.** Whenever you can, store your fuel in an environment in which the temperature is fairly constant. Frequent heating and cooling causes moisture to condense inside the fuel bottle, and excess moisture spoils nitro fuel.

- **Keep the fuel bottle off the floor.** A concrete floor will chill the bottle and can cause the moisture inside it to condense.

- **Cap it!** If your jug of fuel came with a plug under the cap, don't discard the plug; use it whenever you put the fuel away. You'll have a more effective seal than if you use only the cap. If your fuel bottle is flexible enough, squeeze it before you tighten the cap to expel air—less air, less moisture.

Before you put the cap on your fuel bottle, squeeze the bottle to reduce the amount of air that will be sealed inside.



Protect glow plugs

These little guys are incredibly durable and can withstand the ultra-high temperatures of a nitro engine's combustion chamber, but their elements are highly susceptible to being damaged when they aren't in an engine.

- **Don't unwrap 'em until you need 'em.** Keep the plugs in their original packaging until you're ready to use them; there's no better plug protection, and you'll never have to guess which type of plug you have.

- **Use a glow-plug caddy.** If you must remove the plugs from their packaging, thread them into a glow-plug caddy. This will protect their elements and allow you to carry several plugs in one holder.

- **Keep those caps.** Some plugs come with protective caps; save them! If you've run out of room in your plug caddy, install them on other plugs.





Store your lubed filters in plastic bags; they'll stay juicy without accumulating dust and dirt.

Air filters

Like fuel tubing, air filters and their foam elements are easily contaminated. Never allow a filter element to bounce freely inside your toolbox, as dust will find its way into it, and this can damage your engine when you install it.

■ **Keep it in the bag!** Use a clean, sealable sandwich bag to protect your air-filter elements, especially if they're pre-oiled. If they're dry, oil them by squirting filter oil into the bag and squishing it into the filters. They'll be ready to use, and you didn't have to get your fingers oily!

■ **Keep clean with clean and dirty with dirty.** Always store clean foam elements with other clean elements—never with dirty ones, which will easily contaminate the clean ones. Keep them in separate bags.



A plastic bag is the best protection for your fuel tubing. If you don't bag it, at least plug the ends of the tubing to keep toolbox crud out of it.



Store fuel tubing correctly

It's always wise to have spare fuel tubing, but it might get dirty in your pit box, and when you install it, any dirt inside it will be sucked into the engine. Protect your engine by storing the tubing properly.

■ **Coil and bag it.** To keep your tubing free of contaminants, store it in a sealable sandwich bag (your pit box will be neater, too).

■ **Plug its ends.** If you don't store it in a bag, at least seal it by inserting a new 3mm machine thread screw into each end. The screws will act as stoppers and will keep the inside of the tubing clean.

■ **Keep it clear of sharp stuff**—away from hobby blades and other sharp objects. Store sharp tools in other toolbox compartments to avoid puncturing your tubing (you don't want pinhole leaks).

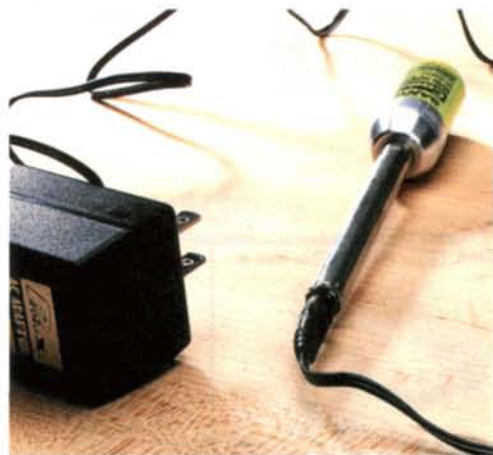
If you take care of your equipment by following these very basic steps, you'll avoid having a silly error keep you in the pits. ■

Glow starters

A glow starter has contact points that transfer electricity into the glow plug, but if these contacts are gunked up because of months of use, the starter may not heat its element at all. And even if you keep your glow starter spotlessly clean, it will be useless if its battery is no good. So

■ **Charge! Charge** rechargeable starters overnight before you head out for a day at the track. If you have a dry-cell starter, always keep a spare battery in your pit box. We've all wasted time troubleshooting an engine that didn't start and then realized that the problem was caused by a dead glow starter!

■ **Keep it clean.** A glow starter's tip easily gets dirty because it's always in contact with mud, fuel residue and other contaminants. Clean its tip regularly with denatured alcohol, motor-spray, or any non-water-based degreaser. You may have to scrub it with a toothbrush to get all the gunk out.



Get the center contact as clean as you can!

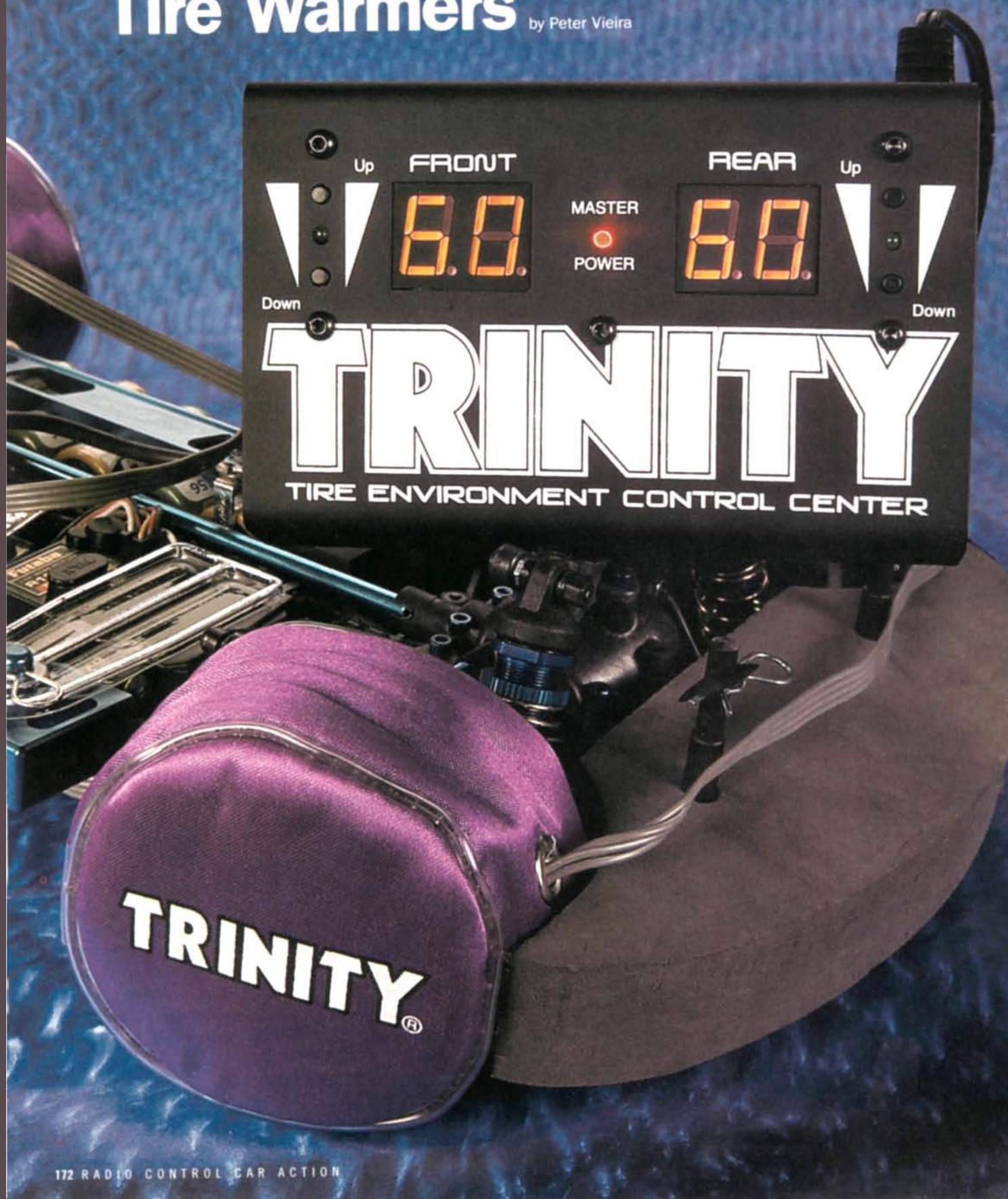


■ **Polish the contacts.** Use a cotton swab to finish cleaning the glow-starter's contacts. For the best performance, the inner bore and the center contact should be spotless.

PRODUCT PHOTO

Trinity Digital Heat Tire Warmers

by Peter Vieira

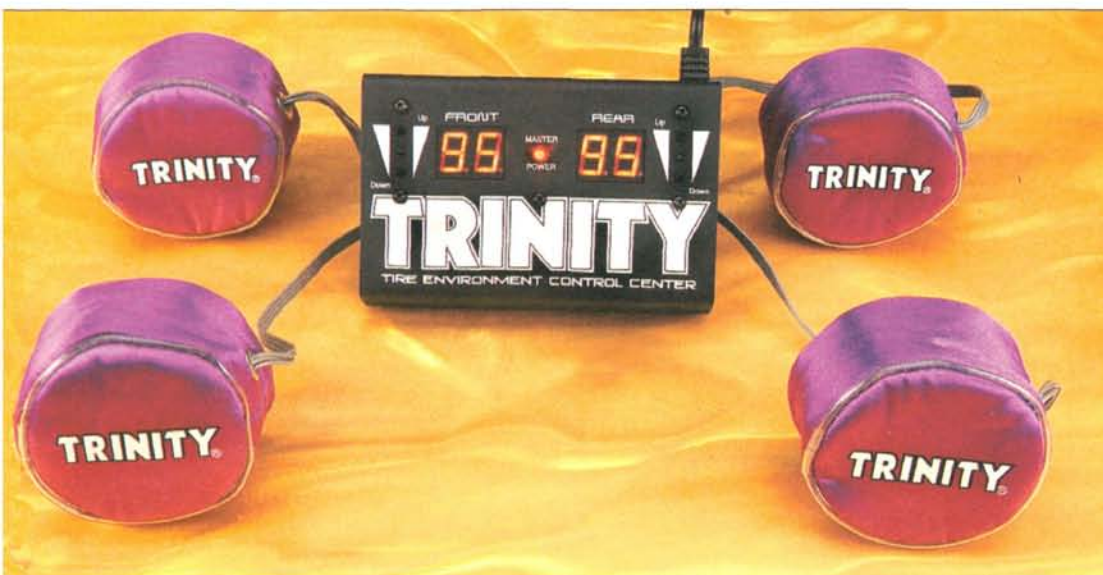


Burnin' rubber

Fric tion causes heat. Heat softens rubber. And that, my friends, is why your touring car's tires stick better one minute into a race than they did at the start tone. The benefit of preheated tires is obvious: instead of holding back during those critical first laps and biding time until the treads warm to full-grip temperature, you can clamp the throttle from the start with toasty tires squeezing the track as hard as they can from the get-go.

To get that grip-giving heat into the tires, Trinity added electric tire warmers to its catalog way back in 1998, and a few other companies have jumped on board with warmers of their own since then. Until now, the warmers all worked about the same, and they all had the same flaw: no means to monitor or adjust the tire temperature.

Trinity's new Digital Heat tire warmers have addressed that concern by incorporating a digital temperature control box in the system, so you can dial in as much heat as you want. It gets better; since the front and rear tires are usually different temperatures after a run, Trinity designed the warmers so that the heat in each pair can be adjusted independently. Sounds good; does it work?



WHAT YOU GET

FOUR TIRE WARMERS. Instead of wraparound strips, each warmer is shaped like a cup. Flexible heating elements in the nylon fabric do the warming, and each warmer is plugged into the control unit separately. As long as you run low-profile racing rubber, the warmers will fit the tires snugly. Tall-profile tires don't fit well, but if you race on wagon wheels, cold tires are the least of your problems.

CONTROL UNIT. The heart of the Digital Heat system is a metal box; it has four jacks for the plug-in warmers and a pair of digital readouts that indicates the temperature of each pair of warmers (metric system alert! The digital readouts indicate temperatures only in Celsius). Each pair of warmers

has a separate set of controls; an "up" key raises the temperature, and a "down" key reduces it.

INSTRUCTIONS. They're on the box, so don't chuck it out until you check it out.

WHAT YOU'LL NEED

POWER SUPPLY. The Digital Heat system runs off DC power, so you'll need a battery pack or DC converter to bring the warmers to life. Any RC 12V power supply will work, or you can use a 10-cell pack to deliver the required voltage. According to Trinity, eight or nine cells may also be used, but this may reduce maximum temperature.

COOL TIPS FOR HOT TIRES

KEEP THE WARMERS ON AS LONG AS YOU CAN.

As soon as the warmers are removed, the tires begin to cool, so keep 'em on until you're just about to put the car on the track.

TEMP THE TIRES AFTER A RUN AT RACE PACE AND THEN SET THE WARMERS TO MATCH.

Don't be surprised to see a difference in the temperatures of the front and rear tires. This difference is the reason Trinity gave the Digital Heat system separate controls for each pair of warmers. You can also use them to heat your tires as "inside" and "outside" pairs. When you race oval, you'll see more heat coming off the outside tires than the inside tires; you can use the individual heat controls to duplicate the phenomenon.

BAKE IN THE TRACTION-COMPOUND GOODNESS.

For extra long-lasting, foam-tire traction, use the warmers to bake in the tire compound. You can go heavy on the sauce, and the warmers' heat will help it saturate the foam for high-endurance grip.



It will be a few laps before these cars have warm tires. With tire warmers, you won't have to wait!

SINCE WHEN IS 70° HOT?

When it's Celsius! While 70° Fahrenheit (F) is a great temperature for a pool, 70° Celsius (C) is considerably hotter; it's equal to 158° F. So when the Digital Heat warmers register a seemingly chilly 37° C, that 37° is actually 100° in "American" temperature.

Converting is easy; just take the Celsius figure, multiply it by 9, divide the result by 5 and then add 32. If you're racer enough to need these warmers, then you must be racer enough that you keep a calculator handy for gear ratios, so break it out and quit griping about the math. Here's that formula again:

$[(\text{Celsius temperature} \times 9) \div 5] + 32 = \text{Fahrenheit temperature.}$

OK; I can still hear you whining, so here's a conversion table for you to stick in your pit box:

FAHRENHEIT	CELSIUS*
70	21
80	27
90	32
100	38
110	43
120	49
130	54
140	60
150	65
160	71
170	77
180	82
190	88
200	93
210	99

*Rounded to nearest whole number

TESTING

I tested the Digital Heat warmers with a 12V, 10A DC power supply. Setting the system up only took a minute, and the unit's 3-foot power wires and 32-inch warmer harnesses made it easy for me to put the car in an out-of-the-way spot on my bench (we bundled the wires for neater photos). As soon as the power supply was connected, the digital readouts indicated the ambient temperature, and the warmers began to heat to the default setting of 60° Celsius (C).

Pressing the "up" and "down" keys adjusts the temperature in 1-degree increments. The digital displays show the temperature of the warmers as they heat up, and during the process you can check your target setting by pressing an "up" or "down" key. When up to temperature, the control unit automatically cycles the power on and off to maintain the setting. A pair of LEDs winks on and off to indicate when the warmers are on and off.

I wanted to work the warmers hard from the start, so I entered the maximum setting of 98° C (208° Fahrenheit) and let the warmers cook. After four minutes, the warmers had reached maximum temperature. But remember, the Digital Heat control box doesn't show the temperature of the tires themselves; although the warmers heat up quickly, it takes time for the tires to absorb and then match the temperature. The longer you let them bake, the more deeply the tires will be heated and the longer they'll retain their heat as you wait for your race to start.

The Digital Heat system was easily dialed down to cooler temps using the "down" keys, and it operated reliably throughout testing. As a final test, I let the warmers crank away at full power all day; after eight hours, they were still holding steady at 98° C.

THE VERDICT

I pressed the buttons, the tires got hot; this thing works! The question is, do you really need it, and is it worth its \$130 price tag? If you're a casual racer, there are smarter ways to spend your money, but if you're out there every weekend and making the A-main, the Digital Heat system is worth a look. It can buy you precious tenths in the early laps of a race, and as you know, every fraction of a second you save gets you closer to the front or extends your gap on the chasing pack. For serious racing, hot tires are definitely cool.

SOURCE GUIDE

TRINITY PRODUCTS INC. (732) 635-1600; teamtrinity.com.



Hard-Wire^{without} the Hassle!

Installing “Corally-style” connectors by Gary Katzer

It's well known that soldering the power leads from the ESC directly to the battery pack—also known as “hard-wiring”—provides the lowest possible electrical resistance and is therefore the most efficient method of connecting your battery packs. The downside is that you have to lug around a soldering iron to make pack changes. You could install low-resistance connectors from DuraTrax, Acer Racing, Deans, or AstroFlight, but the convenience of connectors comes at the expense of efficiency. The connectors are as efficient as the length of wire they replace, but a connector setup invariably requires

more wire than a hard-wired setup, and that means more electrical resistance.

But there is a way to combine hard-wiring efficiency with connector convenience! The solution is a “Corally-style” connector. It's a sleeve that's soldered on the end of a battery pack and accepts a plug that's soldered to an ESC's power wires. The combination was popularized by Corally (hence the name), and Trinity's R-Minus and Team Orion's Twisted Gold connectors work in the same way. It's fairly easy and inexpensive to convert to these connectors. Here's how you do it.

1

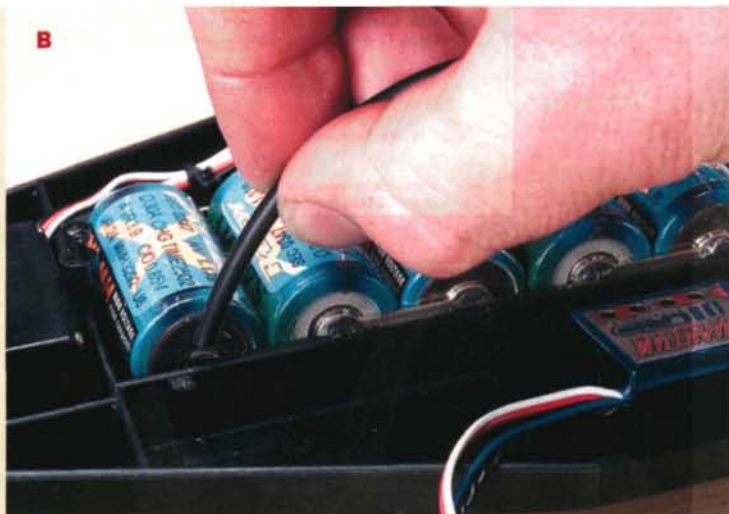
Measure and cut the ESC leads.

A. If you've already set up your vehicle for hard-wiring, your ESC wires are trimmed to the right length. If you're installing a new ESC, place it on the chassis in the spot where it will be permanently installed.

B. Extend the negative battery lead to reach the negative end of the pack, as shown. Note that the lead will make a 180-degree bend to reach the cell. Cut the wire where it meets the cell.

C. The positive cell requires more thought. Depending on the layout of your car, it might be most efficient for the positive lead to go to the motor first and then to the battery. Or it might be better for the lead to be routed to the battery first, and then continue on to the motor without a break in the wire. See the sidebar “Do you need a jumper wire?” for more info.

B





Solder the connectors to the ESC

- A.** Strip about 5mm of insulation off the power leads and coat the wire with flux, then dab a little flux into the back of the male connectors.
- B.** Twist the connector onto the wire, leaving only a small gap of braided wire visible at the top of the connector.
- C.** Use a "third hand" tool or a hemostat to hold the parts, and heat the joint with your soldering iron. Feed solder into the joint so it "wicks" into the braid and connector.



Install the battery tubes

You have two options at this point: you can solder the tubes directly to the ends of the cells,

but in some chassis this may cause problems with the fit; if you can, attach the tube to a battery bar to act as a standoff. It works, but you will be adding more solder joints, and that reduces electrical efficiency. Either way, the steps for the tube installation are the same.

- A.** Clean the tube and the end of the cell or battery bar with motor spray, and apply a dab of flux to the parts.
- B.** Wipe all the solder off the tip of your heated soldering iron, insert its tip into the tube, and hold it against the cell. Placing the tip in the tube makes it easier to hold the tube, and it heats the joint more quickly. If the tip is too big for this technique, use a "third hand" to hold the tube.
- C.** Feed solder into the joint from each side of the tube. Work quickly (but don't rush) to avoid overheating the cell. When the parts cool, you should have a solid joint.



DO YOU NEED A JUMPER WIRE?

Corally-style connectors are designed to be used on the end of a wire, not inline. But most racing trucks and buggies favor a wire-routing layout that has the positive lead pass from the battery to the motor without a break. To install a connector in that layout, you'll need to use a short jumper wire.

- A.** Mark the positive lead where it passes over the positive end of the cell. Be sure to leave a little slack so you can slide the pack fore and aft on the chassis.
- B.** Gently roll the lead under a knife blade to cut two slits in the insulation. Join the slits with a cut, then peel away the insulation.
- C.** Dab the exposed wire with flux, heat it with the soldering iron and coat the gap with solder (this process is called "tinning").
- D.** Cut a short length of wire (25mm or so), strip 5mm of insulation off one end, and tin the exposed wire.
- E.** Using a "third hand" to hold the lead and jumper, solder the parts together as shown.
- F.** Install the connector on the jumper using the steps shown previously.

GET THE RIGHT TOOLS!

Any soldering job will be easier and safer with the right tools. If you're getting serious about electric RC, you'll need these.



- **Professional soldering iron.** Get a 40W model (or a more powerful one). An adjustable unit, such as this one from MPJA Online, is nice to have, but that feature isn't a must-have; heating power is what matters most.
- **Battery jig.** Assembling or working on battery packs is nearly impossible without a jig. Deans makes the best.
- **"Third hand."** You can find these alligator-clip thingies in any hardware department. There's nothing better for holding wires and connectors while soldering.
- **60/40 rosin-core solder.** That's 60 percent tin, 40 percent lead; always get the rosin-core stuff, not acid core. Solder is toxic stuff, so keep it away from any little ones (for that matter, all of your RC gear should be kept away from the little guys).
- **Safety glasses.** Handled properly, solder is very easy to control, but there's always a chance of it spattering, so be safe by wearing safety glasses. Likewise, you shouldn't solder wearing only your underwear—in case a drop of hot solder lands in your lap. Put some pants on!

SOURCE GUIDE

CORALLY USA distributed by Specialized RC Intl. (407) 681-5905; corallyusa.com.
MPJA ONLINE (800) 652-6733; mpja.com.
TRINITY PRODUCTS INC. (732) 635-1600; teamtrinity.com.
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Get stuck!

Make your tires stay glued for good



Monster trucks are the biggest, baddest RC vehicles out there. With the unbelievable force that MT tires experience trying to get power—usually, nitro power—to the ground, they can be ripped right off their rims if they haven't been glued properly. It's an easy job to do, if you just take your time. Before you begin, be sure to work in a well-ventilated area and to wear proper eye protection.

DRILL HOLES

When a tire rolls over uneven terrain, its tread deforms to fit the surface. For this to happen, air must be able to flow in and out of the tires through a vent hole in the rim. Many rims come with predrilled holes, but some don't. If your rims don't have holes in them, simply drill a pair with an 1/8-inch bit toward the inside of the rim to allow air to enter and exit. I like to drill two holes just in case mud, dirt, or crud plugs one of them.

CLEAN THE BEAD

No matter how much or which kind of glue you use, if the mating surfaces of the tire and rim aren't clean, you might as well not bother to use any glue at all. If you plan to use molded rims, use some Scotch-Brite to lightly scuff the inside of the beads of the rims. If you are using chrome rims and the bead is covered with chrome, you'll have to remove it. The glue will stick to the chrome, but the chrome won't stick well to the rim. You can quickly remove the chrome from the rim by using a rotary tool and a wire wheel. Be sure to wear eye protection and to keep the rotary tool at a slow speed so you don't melt the plastic. For aluminum rims, scuff the bead with 600-grit sandpaper or a Scotch-Brite pad; the glue will adhere better to an uneven surface. After you've scuffed the beads of your rim, wipe them down with a clean rag, and motor-spray them to remove any residue.



PHOTOS BY PETE HALL & GERON NEBLETT



CLEAN THE TIRES

Now that the rims have been prepped, it's time to get the tires ready. It's just as important—though not as time-consuming—to prep the tires as it is to prep the rims. Manufacturers use a mold-release agent to pull tires out of their molds after the rubber has cooled and set. This mold-release agent must be removed for the glue to stick properly. Wipe off the inside of the tire with a rag sprayed with motor spray.

TRIM THE INSERTS

Inserts have square profiles and may change the shape of the tires. If you look at the sidewalls of the tires, you'll see that their outside edges are curved. Cut about $\frac{3}{8} \times \frac{3}{8}$ -inch chamfers on the outsides of the inserts to match them to the shape of the tires. When you have finished with the outside edges, turn the inserts inside out and



do the same to the insides. This will allow the inserts to match the bead sections of the rims. After the inserts have been trimmed, twist them back to normal, and install them in the tires. Work the inserts with your fingers to make them sit in the tire properly.

MOUNT THE TIRE

Now it's time to mount the tires with their inserts on the rims. Place one side of each rim in the tire; slide the rim into the tire until it's centered. Pull one side of the tire onto the bead of the rim, then repeat the process on the other side. When the tires are on the rims, work them with your hands to properly seat the inserts on the bead sections. If you're using directional tires, be sure to check that they're mounted facing in the right direction before you glue them.



ADD THE GLUE

Various thicknesses of CA are available; I like to use thick CA to glue monster truck tires. Simply pull the bead back and apply glue between the tire and rim. Work in small sections at a time, and work your way around the rim. Then run a bead of glue around the edge where the tire and rim meet. When the glue has dried, flip the tire and rim over and do the same thing on the other side.

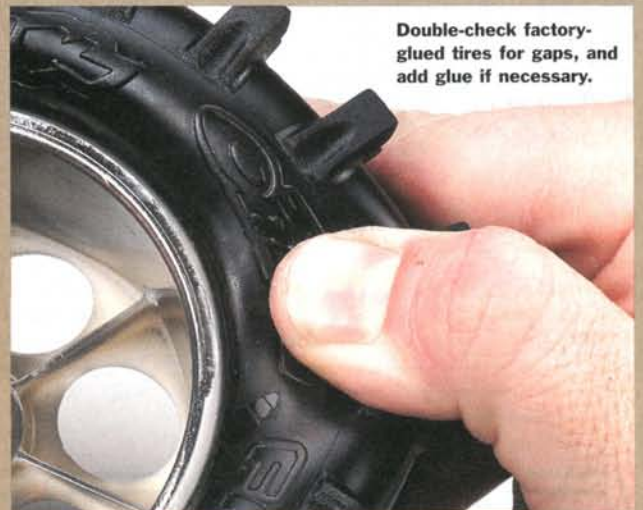
Tire removal

Sometimes, you may have to remove the tire from its rim, especially if you use aluminum rims. I know you don't want to throw away an expensive set of aluminum rims when the tires wear out. Plastic rims aren't expensive, but you may have one crack, or you may have spun the hex in one. If the rim is messed up and the tire is new (or close to it), it's going to hurt when you have to buy new rims and another pair of tires to replace the one bad rim. Here's how to remove the tires from the rims with chemicals. Acetone (nail-polish remover) works very well by dissolving the glue that bonds the tire to its rim. Place the tire and rim in a metal pan, and fill the pan with acetone to about $\frac{1}{4}$ inch up the side of the tire. Let the tire sit for a couple of hours and, using rubber gloves, separate the tire from the bead and let everything dry. Flip the tire and rim over and repeat the process. Do this in a well-ventilated area, and remember that acetone won't affect the tire or aluminum rims, but it may melt some plastic rims. ■

FACTORY-GLUED TIRES

Some RTRs come with glued tires, and glued tires are also available as aftermarket options. It's a good idea to check the bond of the tires to their rims before you run them. For each tire, pull on the bead all around it to make sure that the tire doesn't come off the rim. If the tire moves or separates from the rim, place a few drops of CA on that section. You can use a couple of rubber bands to hold the tire in place until the glue has completely dried.

Factory-glued tires are available from TRC Off Road (top), Pro-Line (center) and Team Orion (bottom).



Double-check factory-glued tires for gaps, and add glue if necessary.

Need a new body for your RTR? Paint your own!

So, after reading a few issues of *RC Car Action*, you decided to get into RC with a ready-to-run car or truck, and you've been having a blast ever since. And your machine's thrashed-out, factory-painted body has the battle scars to prove it. It's time for a new look! Instead of reaching for another original-equipment body, why not go for a new look with an aftermarket shell and your own unique paint job? All you'll need to get stunning results are a few cans of spray paint and masking tape.



1. MARK THE BODY-POST-HOLE POSITIONS

Position the body over the chassis, line up the wheels with the wheel wells, and mark the spots where the body posts contact the shell. You can make a dent with the tip of your hobby knife to mark the spot, or use a permanent-ink marker.

Look directly down on the post to make certain that you mark the hole locations precisely.

2. WASH THE BODY

Although your crystal-clear body looks perfectly clean, it no doubt has fingerprints and dust on its inner surface where all the paint will be applied. Water and dish soap are all you'll need to clean it. When you're finished, dry the body thoroughly with a lint-free towel.

Don't skip this step—unless, of course, you want a big ol' thumbprint on the hood!



3. APPLY THE WINDOW MASKS

Virtually all bodies now include precut window masks; just peel and stick them in place. Be sure to rub the edges of the masks down completely so that they tightly seal out the paint.

Use your thumbnail or the edge of a credit card to rub down the edges of the mask.

WHICH BODY FITS?

Touring car

If you have a touring car, you won't have to look too hard for choices. Any sedan body will fit, as long as it's the right width. Electric cars wear 190mm shells, and nitro cars get 200mm shells (unless you run a Tamiya TG10; that one takes a 190mm).

Truck

There are lots of custom-fit choices for Team Associated, Team Losi and Traxxas vehicles. If your flatbed isn't one of these popular brands, you can either check with your truck's manufacturer to find out whether a clear version of the stock painted body is available, or you can take your truck to the hobby shop and test-fit a few bodies meant for the brands mentioned above. The body-post holes won't line up, so you'll have to mark the new hole positions yourself, and you may have to get creative with the trimming, but odds are, you'll find a pretty close fit.

1/8-scale buggy

There aren't a lot of aftermarket shells out there for big-block buggies, and those that are available are usually for the Kyosho Inferno MP-7.5. No worries, though; all 1/8-scale buggies have similar proportions, and with some custom trimming, you can make an Inferno body fit just about any buggy. Or, you can get a clear version of your buggy's factory-finished shell from the manufacturer.

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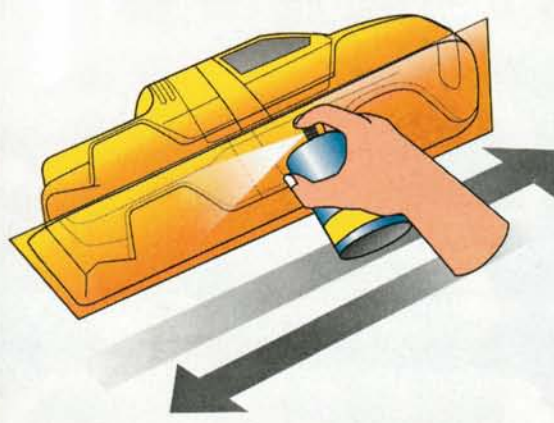
BODY SHOP

4. MASK OFF YOUR DESIGN

For your first paint job, keep things simple with a two-color look. You can sketch on the body with a permanent-ink marker; those lines are easy to remove with denatured alcohol (so much for "permanent"!). When you've settled on a design, tape off the areas that will be painted the lighter color. When you paint, always apply the darkest color first; that way, it won't bleed through the lighter color. See the "Beauty mask" sidebar for more masking tips.



This body is ready for paint; the masked area will be white, so I'll paint that last.



5. PAINT!

Shake the paint can thoroughly, hold it about 10 inches away from the body, and spray in smooth strokes. Stop spraying after each stroke; if you hold the button down nonstop, you'll waste a lot of paint and just create a choking cloud of overspray. Unless you're painting a metallic or candy color, one coat should be enough, but if you notice any thin spots, you can apply a second coat after the first one has dried.

Spray from side to side, and stop between strokes. Don't use the "scribble" technique; it wastes paint and just about guarantees uneven coverage.

6. REMOVE THE MASKS AND APPLY THE SECOND COLOR

After the paint has dried completely, peel off the mask (but leave the window masks on) and paint the second color. Allow it to dry completely, and recoat if necessary.

It's getting there!



This body is looking good now! The pinstripe between the colors is Pactra striping tape that has been applied to the outside of the body. That's cheating, but who cares?

7. THE BIG FINISH

When all the paint is completely dry (to be safe, wait a few hours), peel off the window masks. Instead of picking at the edges with your fingernail, use a hobby knife to lift a corner of the mask; you don't want to scratch your new paint job. You can also peel off the overspray film (look at that shine!) and apply the decals; now your paint job will really come to life.

BEAUTY MASK

There's more to masking than slapping down tape—but not much more! Remember these tips:

1. Use high-quality tape! 3M brand is best; you'll need a roll of 1-inch-thick tape and a roll of 2-inch-thick tape.

2. Never use the "raw" edge of the tape as it comes off the roll.



although it may look smooth, it's actually ragged and can allow paint to bleed underneath it. Place the tape on the body so that it overlaps the edge you're masking, then trim the

tape along the edge with your hobby knife. The crisp, cut edge will seal out paint much better than the original edge. If this seems like too much trouble, try the next tip.



3. Use 1/8-inch Pactra or Parma masking tape. Both brands have crisp edges that seal out paint and are very flexible, so masking curves is easy. Use this narrow tape to mask the breaks between colors, and use the wider 3M tape to fill in larger areas.

4. Don't forget the outside of the body! If your new body doesn't have a protective coating of peel-off overspray film, stretch a piece of plastic food wrap over its outside to protect it from paint overspray.



DON'T BE AFRAID TO CHEAT!

Painting purists say that every graphic on the car's body should be created with paint. But if you're like me, all you want is a good-looking body, and the easier, the better. One easy way to get a great look is to use inside-the-body graphics, such as these from XXX-Main. The flexible vinyl decals are applied inside the body, before painting, and they look killer. Another great cheat is Pactra striping tape; it comes in a lot of colors, and each roll has a variety of widths. Use the tape to set off contrasting colors or by itself for a traditional pinstripe look. The tape curves easily, and it stays stuck.



IT'S ALL IN THE TOOLS

TRIMMING AND MOUNTING:

Trimming a body properly doesn't take any special skills, just some special tools. Add these to your toolbox, and you'll be an instant body-mounting pro.

■ **Reamer.** You'll use this tool to make precise holes. The RC-specific versions from Hudy, OFNA, DuraTrax and others work best, but the fluted reamers available in hardware stores work well, too, if you make a pilot hole first. The OFNA tool shown here costs \$20; the hardware-store version will set you back \$10.

■ **Lexan body scissors.** Skip the kitchen-drawer shears and buy a pair of these. Their short, curved blades cut plastic easily and cut smoothly around corners. These scissors are from DuraTrax, and they sell for about \$10.

■ **Hobby knife and no. 11 blades.** You'll use this tool all the time to cut out decals, score plastic, trim masking tape and more. About \$7, with spare blades.

■ **Circle cutter.** This is an optional item, but it's a must-have for cutting wheel wells in touring-car bodies and cooling holes in nitro bodies. This one is from Olfa and costs about \$12.



CONTACT THE BODY SHOP

Send your "Body Shop" questions and comments to bodyshop@airage.com.

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DURATRAX distributed by Great Planes Model Distributors; duratrax.com.
GREAT PLANES MODEL DISTRIBUTORS (217) 398-8970; greatplanes.com.
HUDY SPECIAL PRODUCTS distributed by Serpent Inc. USA (305) 639-9665; hudy.net.
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Tuning for high-speed running

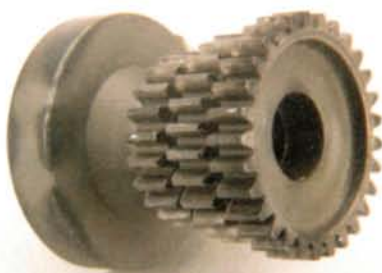
For the typical bashing session, an empty, smoothly paved parking lot is a dream come true. What better way to stretch your nitro RC vehicle's capabilities than to blast it wide open across a parking lot at nearly illegal speeds? It's even more fun when you're chasing down a friend's car (or vice versa). No one denies the fun factor—and the adrenaline rush—that accompany watching and hearing an RC car streak across a parking lot while emitting a high-pitched “waaaaaaa!” But this kind of full-clamp running can lead to premature wear and tear on your vehicle's 2-stroke engine and has been known to cause catastrophic damage in the form of a snapped or stretched connecting rod or a seized piston and sleeve. If, however, you follow these tips for preparing and tuning your nitro RC vehicle for parking-lot running, you'll end up with a longer-lasting, faster machine that won't ruin your day at the parking lot by making the dreaded “waaaaaaa-snap!” sound.



Fuel with higher oil content provides extra protection against wear and the damage that can result from high-rpm engine operation.

1 RUN FUEL WITH A HIGHER OIL CONTENT. If you're less than confident about your tuning abilities but want to learn to tune your engine for top-speed running, remember that high-oil-content nitro fuel can protect it from lean-running conditions. A bad needle-valve setting will be far less damaging if you use fuel that has a high-oil content instead of one with low oil; check your fuel's label for the oil percentage, and look for 14 to 18 percent total oil content for the best protection. If your fuel contains less than 12-percent oil, pour a few ounces of castor oil (available at hobby and motorcycle shops) directly into the fuel jug. Shake it vigorously, and the fuel will be ready for use.

ONE OF THE SIMPLEST SPEED BOOSTS FOR ANY NITRO VEHICLE IS A GEAR SWAP



Optional larger clutch-bell gears or smaller spur gears can be used separately or in combination to reduce engine rpm at full speed, and this will help prevent engine failure.

gear. Altering your vehicle's gearing to a higher overall ratio will cause the engine to spool up more slowly and peak as the vehicle reaches a much higher top speed than it did before the gear swap; plus, you'll save the engine from straining at maximum rpm for an extended time. Optional gears are available for nearly every nitro vehicle on the market; check your instruction manual for specific part numbers.

2 CHANGE GEAR RATIO. One of the simplest speed boosts for any nitro vehicle is a gear swap; higher gear ratios allow your vehicle to reach impressive top speeds without over-revving the engine. Obviously, a vehicle that accelerates quickly and reaches top speed after only 30 feet will be at risk of over-revving if it's forced to travel 200 feet at wide-open throttle. Consider swapping the clutch bell with a larger bell (two or three teeth higher than stock gearing), or install a smaller spur



3 RICHEN YOUR FUEL MIXTURE.

Parking-lot speed runs require that your engine's carburetor be adjusted for protection from an overly lean, hot environment. As the engine spins up to maximum rpm, heat increases dramatically, and the need for vital cooling fuel and lubrication becomes critical, and the only way to increase lubrication inside the engine is by richening the fuel mixture. Contrary to common sense, which seems to indicate that faster top speed equals leaner needle settings, you must tune your engine moderately rich to allow it to pull maximum rpm without allowing the engine to become starved for lubrication.

If you plan to drive your nitro vehicle for extended periods at full throttle, first tune the engine as you would to achieve what you consider the highest possible top speed while still seeing plenty of exhaust smoke. Temperatures should remain below the 270-degrees Fahrenheit mark; if the engine is hotter than 270 degrees, richen the high-speed needle $\frac{1}{8}$ turn until the temperatures drop to the mid-200s. Tuning to a specific temperature is never advisable, but monitoring temperatures and adjusting the fuel mixture to prevent overheating (especially during parking-lot runs) will prevent engine damage. When the engine has been “ideally” tuned for top speed, richen the high-speed needle a minimum of $\frac{1}{8}$ turn to provide the extra lubrication protection and cooling that it will require during high-speed runs.

To help the engine cope with high-rpm operation, mixture settings need to be as much as $\frac{1}{4}$ -turn richer. The richer setting will slow acceleration slightly, but it's the only way to ensure that sufficient fuel and oil flow into the engine at speeds around 40,000rpm.

NEW FOR NITRO



FIORONI Turbo Sliding Clutch & Shoes

Fioroni's latest 1/8 buggy-clutch system boasts a totally new design that's advertised as durable as well as performance-oriented. Both the carbon (black) and Teflon/glass (white) 2-piece clutch-shoe sets require the blue-anodized Fioroni Turbo clutch flywheel. Installation is a breeze; insert two springs (included) in the front and rear grooves on the clutch-shoe set, and then simply slide the shoes into the housing to complete the installation. Fioroni claims that the black-carbon Turbo shoes offer the best low-end clutch engagement, while the white Teflon/glass shoes offer milder engagement with increased life span. The clutch shoes' extra-large contact area ensures snappy clutch engagement, and maintenance is simple thanks to the easily removable clutch shoes. Fioroni offers its Turbo Sliding Clutch system for the Kyosho Inferno 7.5 and a "universal" clutch for the GS Storm, Mugen MBX series and Thunder Tiger EB-4 buggies.

Fioroni Turbo Sliding Clutch Flywheel & Nut for Inferno 7.5; item no. OT-FR51
Fioroni Turbo Sliding Clutch (black/white Teflon/glass)—OT-FR52/OT-FR53
General Sillicones, USA Inc.; (626) 338-3815; generalsillicones.com

MIP Shiny option parts for T-Maxx

MIP now offers a four-pack of Shiny shock bodies and a boost-bottle kit for the new Traxxas 2.5 T-Maxx. The direct-replacement Shiny shock bodies feature (obviously) a chrome-like, polished finish. The similarly "shiny" boost bottle comes with all the necessary mounting hardware required to install it on Traxxas' potent 2.5 powerplant.

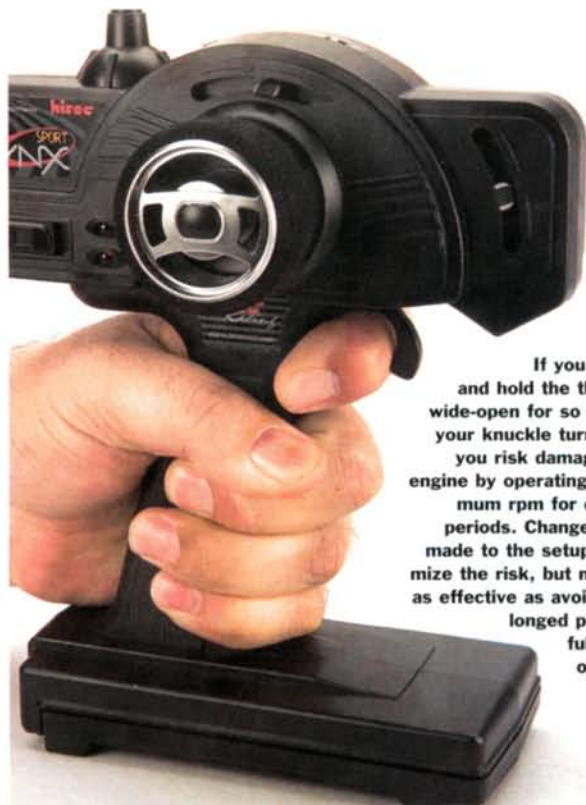
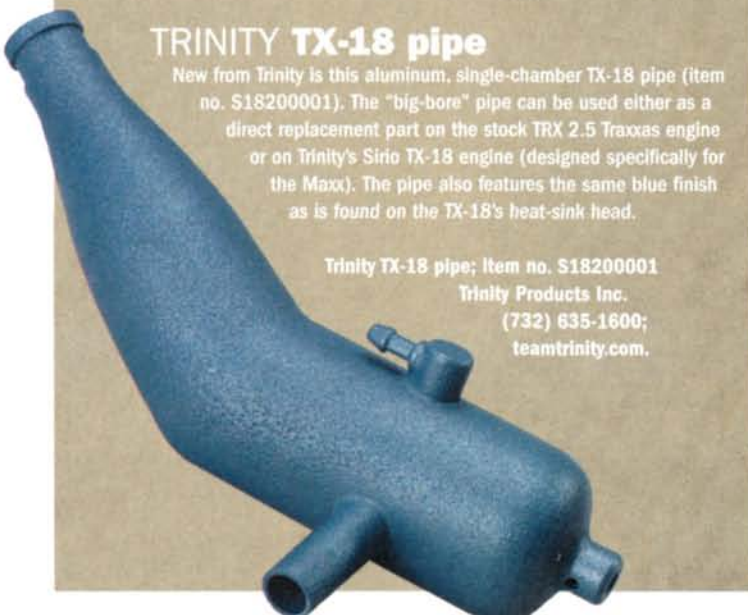


MIP Shiny Shock Bodies (4); item no. 3084
MIP Shiny Boost Bottle Kit TRX 2.5; item no. 3082
MIP (626) 339-9007; miponline.com

TRINITY TX-18 pipe

New from Trinity is this aluminum, single-chamber TX-18 pipe (item no. S18200001). The "big-bore" pipe can be used either as a direct replacement part on the stock TRX 2.5 Traxxas engine or on Trinity's Sirio TX-18 engine (designed specifically for the Maxx). The pipe also features the same blue finish as is found on the TX-18's heat-sink head.

Trinity TX-18 pipe; item no. S18200001
Trinity Products Inc.
(732) 635-1600;
teamtrinity.com



If you squeeze and hold the throttle at wide-open for so long that your knuckle turns white, you risk damaging your engine by operating at maximum rpm for extended periods. Changes can be made to the setup to minimize the risk, but nothing is as effective as avoiding prolonged periods of full-throttle operation.

4 DON'T RUN AT FULL THROTTLE FOR EXTENDED PERIODS. Driving a nitro vehicle with a higher gear ratio and a properly tuned engine will reduce the most damaging threats to the engine, but your driving style must also be appropriately controlled. Some RC'ers think it's safe to hold the throttle trigger wide open for minutes at a time, as though it was an on/off switch. Whenever possible, ease off the throttle and allow the engine rpm to decrease after several seconds of full-throttle running. Easing off the throttle—even for a second or two—allows the engine to cool slightly and eases the strain on its components.

Q I'm trying to figure out why my Associated RC10GT doesn't run like it used to. I bought it six months ago, run it on the weekends and have had nothing but fun with it. Last weekend, though, the truck stopped running whenever I slowed down and hit the brakes. This is my first nitro truck, and I know I'm tuning it well because I see lots of exhaust smoke, and the truck can run for hours without dying. But lately it seems as if I have to run it without stopping, or else it will die. What could be causing this? I've tried new glow plugs and new fuel, and nothing seems to work.

A There are usually two reasons why a truck's engine dies when the brakes are applied: either the idle-stop screw on the engine's carburetor has gone out of adjustment, allowing the carburetor to block all the air entering the engine when the brakes are hit, or the clutch is damaged. To check the idle-stop screw's adjustment, remove the air filter from the carburetor and look down into the carb opening (venturi). Apply full brake on the transmitter, and check whether there's a small (approximately 1- to 2mm-wide) gap inside the venturi. If the carburetor barrel closes completely (no gap), you need to screw in the idle-stop screw until a 1- to 2mm-wide gap is created. This will allow air to pass into the engine, even at full brake.

Regarding the damaged clutch: when the engine can't spin independently of the clutch bell at low rpm, it causes the engine to stall. This could be caused by damaged clutch shoes or damaged clutch-bell bearings. Remove the engine from the truck and inspect the clutch's components. Make sure that the clutch shoes are not damaged (melted) or otherwise stuck in the engaged position. One (or both) of the bearings in the clutch bell might be damaged, and this will also cause the engine to stall when you attempt to stop the truck. Inspect and replace the clutch shoes and/or clutch-bell bearings if necessary, and then reinstall the engine. One of these suggestions should solve your problem.

CONTACT THE PISTON POWER SOURCE
Send your questions and comments to Stephen Bess, stephenb@airage.com.

OFNA Works Stand

STILL USING THAT BATTERED OLD BLOCK OF WOOD to work on your cherished RC ride? Check out OFNA's new Works Stand. It's constructed of 2.5mm-thick stamped aluminum and comes in three colors: anodized purple, blue and black. Its two-piece design consists of a base and a swiveling upper work tray. The tray's surface is covered with dense foam rubber so your car stays put, and the tray rotates on high-quality bearings that, though durable, actually spin too easily; every time you put a wrench to the car, it spins away from you. The fix is easy: just drop a fender washer between the tray and the base to add a little drag.

The base is all about keeping things tidy. A shock-filling station on one side holds four shocks. There are slots for the shock shafts, but the bodies just balance on a shelf and can easily be knocked over (especially



when the tray rotates, as it isn't tall enough to clear the shock bodies). A magnetic strip on the base's other side is useful, as it prevents small nuts, bolts and the oh-so-easy-to-lose E-clips from disappearing. When you finish wrenching, the Works Stand is easy to collapse for storage; just install the tray under the base.

In use, the Works Stand proved durable and stable, and it easily supported 1/8-scale vehicles. The magnetic strip was a popular feature, and although the shock stand wasn't ideally suited to a hectic race-day pit environment, it was useful in quieter building sessions at home.

WORKS STAND

Item no.	10904 (Purple), 10905 (Blue), 10906 (Black)
Price	\$34.95

OFNA Racing
(949) 586-2910; ofna.com.



Argus Machine RC Pro Stand

ARGUS MACHINE'S COMPUTER-DESIGNED RC PRO STAND is CNC-machined almost entirely from billet aluminum; for durability and strength, certain key components are made of alloy steel. A locking pivot ball with clamping jaws sits atop a 12-inch aluminum column and holds your truck in almost any position. Each stand comes with an aluminum transmission skidplate that you can quickly install on your truck and clamp securely in the stand's cam-activated jaws. A lever on the column locks or releases the pivoting head to allow 70 degrees of travel, and two slots allow you to position your truck vertically.



The stand comes in two versions: the F-Stand (shown here) has legs that telescope inside the body, and the X-Stand has removable legs that are tightly held in place by an interference-fit design.

We installed the included aluminum skidplate and hardware to our T-Maxx without any modifications to the truck or plate. We dropped the truck onto the RC Pro Stand, flicked the clamping lever, and the truck was held tightly, as though in a vise. You can adjust the clamping force to suit your preference. Pushing down on the cam lever quickly and easily locked the vehicle into virtually any position, and the truck never budged while

we wrenched. The stand holds the truck with its wheels free, so it's invaluable for engine tuning. The stand safely held a Traxxas T-Maxx stable while we ripped the throttle from idle to full tilt, and it took less than a second to flip the quick-release clamp open and release the skidplate.

The RC Pro Stand is arguably the ultimate truck stand, and at more than \$100, it isn't cheap. Is it worth it? Try it once, and you'll probably think so. Every penny of the asking price shows up in the stand's materials and craftsmanship, and it really makes monster-truck maintenance and tuning easier.

Item nos. vary with stand type; versions available for Traxxas T-Maxx; HPI Savage 21 and others coming soon.

Argus Machine Inc. (520) 293-7818;
argus-machine.com.

RC PRO STAND

Item no.	2680
Price	\$120 (X-Stand) \$130 (F-Stand)



Tamiya Spray-Work Airbrush Stand

TAMIYA'S SPRAY-WORK AIRBRUSH STAND HOLDS two airbrushes, so you won't spill another drop of paint. The metal stand clamps onto the side of any table up to 56mm thick and has felt-padded jaws so the clamp won't mar the table. The stand's wire cradles are rubber-coated to gently hold your airbrushes at the ready, and they're attached to the clamp with a thumbscrew. The cradles can be rotated on the clamp, so you can position your airbrushes to suit your workspace.

We tested the stand with Iwata and Tamiya brushes, which fit well, and an Aztec brush, which didn't fit quite as nicely but was held securely and was stable. And as you might imagine, "holstering" the airbrush between coats was much easier (and neater!) than having to carefully balance a loaded brush on a flat bench top.

Tamiya America Inc. (800) 826-4922; tamiyausa.com.

SPRAY-WORK AIRBRUSH STAND

Item no. 74513

Price \$29.99

Tamiya TRF fluorine-coated damper set

TAMIYA'S SUPER LOW FRICTION SHOCKS HAVE ALWAYS been super-smooth performers, but these new fluorine-coated versions just might be the ultimate touring-car shocks. You'll find identical units on Tamiya's top-flight 414M2 and TB Evolution III kits, and they're compatible with Tamiya's TA, TB and TRF Series sedans. The big new feature is the fluorine coating on the shock shafts and shock bodies. Its incredibly low coefficient of friction helps the shocks operate with more impressive smoothness and reduces the seals' "stiction" against the shafts. In addition to fluorine coating, the shocks have shaft guides and pistons made of fluorinated plastic; these shocks have about as much friction as oiled ice cubes.

Other features increase the shocks' trick factor and convenience. The shock bodies are finely threaded to accept a knurled-plastic preload adjuster, so you won't have to keep track of clip-on spacers in your toolbox. Bladders beneath the aluminum shock caps compensate for the oil displaced by the shock shaft during compression, and a foam urethane "spring" on top of the bladder ensures that the bladder returns to its uncompressed shape when the shocks rebound. Two sets of pistons are provided (2- and 3-hole), and each shock is sealed by a silicone O-ring inside a screw-on cap—no wire clips or snap rings to wrestle with, so rebuilds are easy. Yellow springs rated at 13 pounds are included (stiffer than Tamiya's red springs but softer than the blue and white tuning springs). The springs sit on beautifully machined aluminum perches that have been drilled to reduce weight and to prevent crud from accumulating.

Assembling the TRF shocks is simple, and if you have a Tamiya car, they'll snap right into place. If you have another brand, you're in luck: Tamiya includes the 3mm ball studs that the shock ends snap onto, so you can retrofit most cars without a Frankenstein arrangement of



mismatched parts. For additional fit flexibility, you can install longer eyelets or internal spacers snipped from the included parts trees. There's even a 1-hole piston (made of regular plastic, though—not fluorine). The TB Evolution III was our test bed for the shocks since they are included standard equipment, and during the rigorous testing for our "Shaft Drive Showdown," the shocks performed superbly. The seals didn't weep, preload adjustments were easy to make, and the settings stayed put. These excellent shocks are a fine upgrade for any tourer—Tamiya or otherwise.

FLUORINE-COATED DAMPER SET

Item no. 53571

Price \$74

Tamiya America Inc. (800) 826-4922;
tamiyausa.com.

Niftech Electric screwdriver

NIFTECH'S SCREWDRIVER KIT COMES IN a plastic storage case that holds the screwdriver, a wall charger, 36 bits, a socket adapter and a bit extension. The hex-head and socket bits are in metric measurements only (no non-metric bits). A pivot in the middle of the screwdriver's handle lets you switch the tool from its straight configuration to a "pistol" shape with a 60-degree angle. This gives you more control over the tool, and we found it much more comfortable to use. A forward/reverse switch is positioned perfectly for your thumb.



The tool's best feature is an adjustable clutch that's controlled by the torque-control knob at the end of the driver. There are six torque settings: "1" provides the least torque, and "6" is the maximum. A rechargeable battery pack powers the unit, so you don't have to be tied to a power

cord. The screwdriver comes out of the box uncharged, but Niftech supplies a wall charger that will juice up its battery in 10 to 12 hours. An optional drill chuck (item no. 3176) is also available.

We charged the screwdriver overnight, and in the morning, it was ready for some chassis teardowns. In tests, we found that settings 1 and 2 were usually best for screwing in hardware, but this varies with the



type of fastener and the material into which it is being threaded. With the driver set at 6, we were able to break free the toughest screws—even the ones held in with thread-lock.

Included bits: blade screwdriver—4, 4.5, 5.5, 7mm; Phillips screwdriver—0, 1, 2, 3; Posi-style screwdriver—0, 1, 2, 3; Torx-style drivers—10, 15, 20, 25, 27, 30, 40, 45mm; metric hex driver—1.5, 2, 2.5, 3, 4, 5, 6, 7mm; metric socket—6, 7, 8, 9, 10, 11, 12, 13mm. ■

Niftech (440) 257-6018; niftech.com.

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Item no.	3175-ELC-DRIVE
Price	\$59.95

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We Got a HUMMER!



File this one under "Dream come true." We just about died when this screaming yellow Hummer H2 became the official RC Car Action-mobile. Kev broke it in with a major photo-shoot expedition for our upcoming *Monster Trucks* special issue. He's trying to look tough here, but trust us, he was doing the "Oh-what-a-feeling" Toyota jump about 10 seconds before this shot was taken.

GIRLS GONE WILD—on the track, that is

Everyone's favorite RCX girl, "Miss Becky" (in the red shorts) sent us these shots of assorted Import Revolution hotties doing a little racing with the help of the Team Losi guys (that's Losi's Todd Hodge in the middle). They vied for two awards: "Overall Best Driver," which was won by Cathy Shim, and "Looked Hottest While Racing," which went to Natasha Yi. Look for more action like this at RCX!



From left: Tila Nguyen, Natasha Yi, Todd, Miss Becky and Cathy Shim,



Cherie Roberts, Tila and Natasha.

TODD'S TOP 10 PICKUP LINES*

10. There are a lot of pretty girls here, but you're top qualifier.
9. Don't listen to Drake; I do to like girls.
8. I drive a Ferrari. It's 1/10 scale.
7. Is your receiver switched off? I've been sending you signals all day.
6. I'm not actually this tall. I'm sitting on my wallet.
5. I'm so attracted to you; it's like you're a motor and I'm a body clip.
4. You're the kind of girl I could really get into stalking.
3. Are you powered by GP3300 cells? 'Cause you've been running around my head all day.
2. No, that isn't a stick pack, and yes, I am glad to see you.
1. Sure, I can introduce you to Matt Francis.

*We made these up. Todd is happily married (and we hope he still will be after his wife sees these pics).

SECRET-CONTEST WINNER



Did you find the secret contest in the April issue? Look closely at the front bumper on the Protoform Monte Carlo (reprinted above). Aha! A secret email address! If you responded, you were sent an auto reply with this riddle:

You are captured by evil aliens. They ask you to make a statement. If your statement is truthful, they will laser-blast you to atoms. If your statement is a lie, they'll eject you into space. But there is one statement that can get you out alive. What is it, and how does it spare you?

The correct answer? "You will eject me into space." If the aliens do eject you into space, your statement was the truth, so they should have laser-blasted you. But if they laser-blast you, your statement was therefore a lie, so you should be ejected into space. Take that, stupid aliens.

DAMN!



THE WINNER

Jake Murphy of Nineveh, IN, was randomly selected from the correct respondents. He wins an LRP Quantum Competition ESC and Trinity Speed Gems Pro Pyrite 10-turn motor. Congratulations, Jake!

